WESTERN INDUSTRY

VOLUME VIII NO. 12

VICTOR

ARMY E NAVY

Photos Courtesy Richmond Shipyard No. 1 and Marinship Corporation

Why did they select VICTOR torches?

The reason can be easily stated and you can easily verify it. VICTOR hand and machine cutting torches cut faster, are more economical to own and to operate, stay on the job longer, and when they do need reconditioning, can be repaired more easily and more efficiently.

A beautifully illustrated and fully descriptive catalog is yours for the asking—really, you should request YOUR copy.

VICTOR EQUIPMENT COMPANY

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SMALL IN SIZE!
HERE'S Epcon Portable Generator in action . . . providing power and light for a camp repair shop.
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to your specifications

Yes sir . . . when we get this war out of the way we here at Gardiner . . . with sleeves rolled up . . . want to work for YOU!

With the modern equipment and experience gained from filling Uncle Sam's exacting war orders . . . we can do a better job for you.

Take our giant, new upsetter for instance. This machine can turn out forgings up to 5" in diameter . . . special forgings for your special job! Large diesel connecting rods for example.

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SYMBOLIC EMBLEM OF THE DROP FORGING ASSOCIATION

EDITORIAL COMMENT

(Communications on any subject of interest to our readers are welcomed. If author wishes, his name will not be used. Unsigned contributions will be disregarded.)

From the Editor's Field Book

AFTER telling the dear readers how tough the transportation situation is, it's somewhat of a surprise that compartments on the Lark and on other first-class trains are still sold to one person only.

Once upon a time, about 25 years ago, that person who today wouldn't share his compartment with a strange male under any circumstances because this is still the good old U.S.A., used to lie in a pup tent with another soldier's feet in his face and be mighty thankful for that much shelter.

One frequent traveler who has given up trying to get reservations and merely boards trains and buys his berth afterward—if he can—got highly indignant when refused permission to bunk in a car that had only seven men in it in one group and another man sitting by himself a short distance away. Argument was becoming extremely heated when the solitary individual remarked, "These seven men are going to San Quentin. Do you really want to join them?"

Despite the alertness of the Los Angeles Chamber of Commerce, it has failed to put forth any publicity about its special research department known as "The Bullring." The department meets around the lunch table upstairs in the C of C Building. Although neither the Army, Navy, OWI or Bureau of Censorship has consented to publication of this highly confidential info., your editor desires to report that this research project has determined that the average diameter of the hole in a doughnut is 1-1/16 inches. ▾ ▾ ▾ Ye editor was trying to explain to a friend just what the National Council of State Governments is. "This country is in a heck of a fix," replied the friend, "when the states have to form a union to protect themselves against the United States."

Get set for some more secret information: in the wonderful wind tunnel that California Institute of Technology is building for four of the big aircraft companies to test plane performance there are steel vanes to deflect the wind around the corners. As those visitors who enjoy the rare privilege of inspecting construction operations climb through the tunnel, they see one vane after another marked in chalk "Not here"; finally they discover one marked "Big guts enter here." Ye ed. got through one of the "not here" openings all right, but we know some editors who couldn't.

Greatest secret in the world, next to what the Japanese High Command really thinks of its war prospects, is what the airframe factories will do after the war. Seems that one hopeful official of one of these big companies made a speech a while back in which he announced that his company could make "140 different items that weren't airplanes," but very shortly afterward his president announced that "our company has absolutely no post-war plans whatever." ▾ ▾ ▾ Very hush! hush! was the synthetic rubber project in Southern California until rather recently. Norden bomb sight was the topic for a woman's club open forum compared to the secrecy enveloping synthetic rubber. The lid has been lifted a little, however, and some of the companies in the program thought it might be a good idea to put on an open house for some of the leading lights in the community; on second thought, however, it was felt it would not be in good taste, and besides there was the shortage of gasoline and food to be taken into consideration, so instead a brochure will be printed. Who says the pen isn't mightier than the banquet?

WESTERN INDUSTRY

News, Methods, Solutions to Problems of the Principal Manufacturing and Processing Industries of the West

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OUR COVER PICTURE

• All of the West's needs in rubber will be supplied through the Southern California synthetic rubber project that began operations last June and will be in full production early in 1944. Co-operating in this project are Shell and Standard oil companies, Southern California Gas Company, Dow Chemical Company and Goodyear and United States rubber companies. The picture shows an ethyl benzene unit in the Dow Chemical Company division of the project, which produces the styrene that is mixed with butadiene and then treated to form synthetic rubber—which really isn't rubber at all, but instead is a plastic.

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Published by King Publications

503 MARKET STREET SAN FRANCISCO, 5, CALIF.

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In these times of WAR, speed in placing such plants on stream is vital. And speed calls for adequate man power, the ability to get materials on the job at the exact moment of need and adequate construction equipment. Fluor offers all three!

The Fluor organization is complete. It consists of more than 3,000 men—executives, engineers, draftsmen, purchasing agents, expediters, carpenters, welders, pipe and steam fitters, heavy equipment operators, laborers and all the supporting personnel that form the makeup of an organization adequately staffed and with the essential know-how! Fluor owns and maintains its own construction equipment in adequate quantities capable of handling the largest construction job—and this equipment is strategically located, ready for use in any part of the United States.

These men, with their specialized abilities, skills and brawn and company-owned equipment are ready to go to work for you immediately. For discussion of how Fluor can meet your problem and meet it quickly—WRITE or WIRE!

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Planning Ahead for a Proven Demand

Producers of gages don't develop manufacturing facilities over night. First, trained personnel must be assembled, top mechanics in their lines; second, special machine tools are required; third, manufacturing methods and processes must be right. Essential as are these three factors, most important of all is probably that priceless ingredient—experience. For years Kobe has made precision equipment and in 1939, 1940 and 1941 started expanding their previously private gage plant. Then as American industry swung into their new, gigantic task of producing for war, Kobe's picture changed. Trained personnel increased, more and more machinery and testing equipment found its way into the Kobe plant, and the plant itself expanded in size, in volume and in character of work handled. The recentness of this expansion has resulted in an uniquely balanced plan for comprehensive precision gage manufacture.

After Victory we hope to tell you of the part Kobe master and reference gages are playing in the war. It will make profitable reading for post-war industry. The reason is simple. The modern and expanded facilities of Kobe's gage plant, developed to the fullest during wartime, will be available for the manufacture of gages to check accuracy and precision in every peace-time industry.

The largest proportion of present day production is going for war needs, but the facilities of this modern plant will be available for peacetime industrialists. Even today, working with new materials, Kobe has devoted considerable thought to adaptation to peacetime needs. Testing, improving, re-testing and perfecting—production efforts all aimed at what industries will require after the war.

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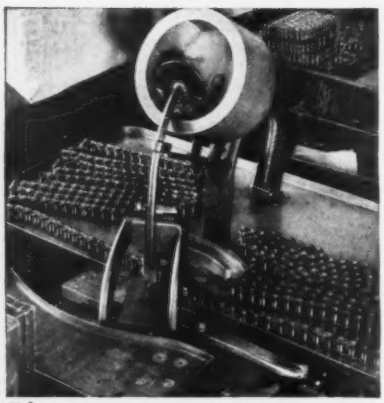
better Methods that use fewer hands



Automatic cotter pin inserting machine for chain belt manufacture assures greater accuracy and uniformity.

Machine design methods, by taking over tedious and laborious tasks in industry, have helped to create in America a civilization which allows men to live as well as to work. An example of progressive machine design that solved a very difficult problem is this Baldwin-Duckworth cotter pin inserting machine for chain belt manufacture. It makes an automatic operation of a task that previously required much hand labor—and at the same time provides greater accuracy and uniformity in the finished product.

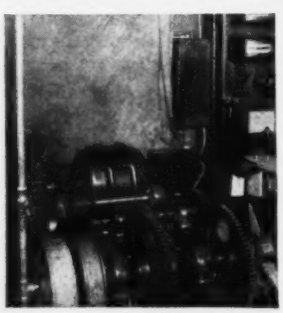
better Drives with Baldwin Roller Chain Belts

This and many other improvements in chain belts are of significance in the solution of drive problems which face every factory maintenance man. Baldwin Roller Chain Belts insure accurate, split-second timing, deliver virtually 100% efficiency, absorb all shocks and give perfect maintenance of speed ratio. In fact, *roller chain belts are the only type of transmission that can absorb shock loading without loss of speed ratios and efficiency.*

Baldwin-Duckworth offers a comprehensive catalog on roller chain belts for the transmission of power and conveying materials. But for specialized applications involving any machine which you may be redesigning or which needs greater drive efficiency, call in a Baldwin man. He will be glad to work with you.

BALDWIN-DUCKWORTH Division of Chain Belt Company, 352 Plainfield Street, Springfield, Mass.

EXAMPLE



This chain drive using single, double and multiple strand roller chain gives:

1. Quiet, smooth operation
2. Positive transmission of power
3. No power loss due to slippage

IT'S BALDWIN-EQUIPPED

better Drives through better Methods

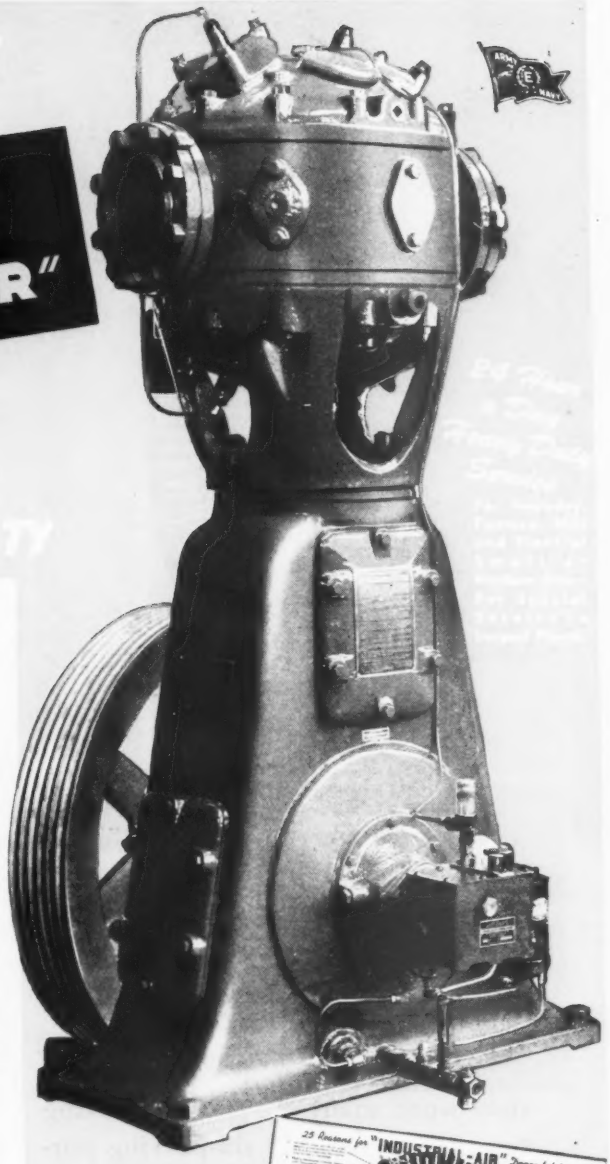
BALDWIN

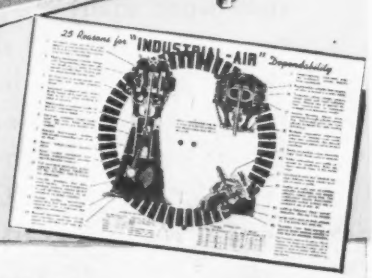
ROLLER CHAIN BELTS

THE AIR COMPRESSOR FOR HEAVY DUTY

SULLIVAN "INDUSTRIAL-AIR"

WITH 25 REASONS FOR GREATER DEPENDABILITY





● The same engineers, the same thinking, the same design, the same materials that produced the famous Sullivan PACKAGE TYPE COMPRESSOR—produced this Sullivan "INDUSTRIAL-AIR". It is performing in the same way. It is giving the same satisfaction. It is the only single-stage, double-acting compressor that gives you full force feed lubrication, replaceable cylinder liners and crosshead guides, anti-friction main bearings, the exclusive Sullivan "Dual-Cushion" Valves and greater capacity per foot of floor space. Made in eleven sizes with displacements from 153 to 822 C.F.M. and pressures from 30 to 150 lbs.

It has 25 important features of construction that add up to greater dependability, longer life, more air... features you *should* know... features told at length in Bulletin A-43. Get a copy from your Sullivan branch office today. SULLIVAN MACHINERY COMPANY, Michigan City, Indiana. *In Canada:* Canadian Sullivan Machinery Co., Ltd., Dundas, Ont.

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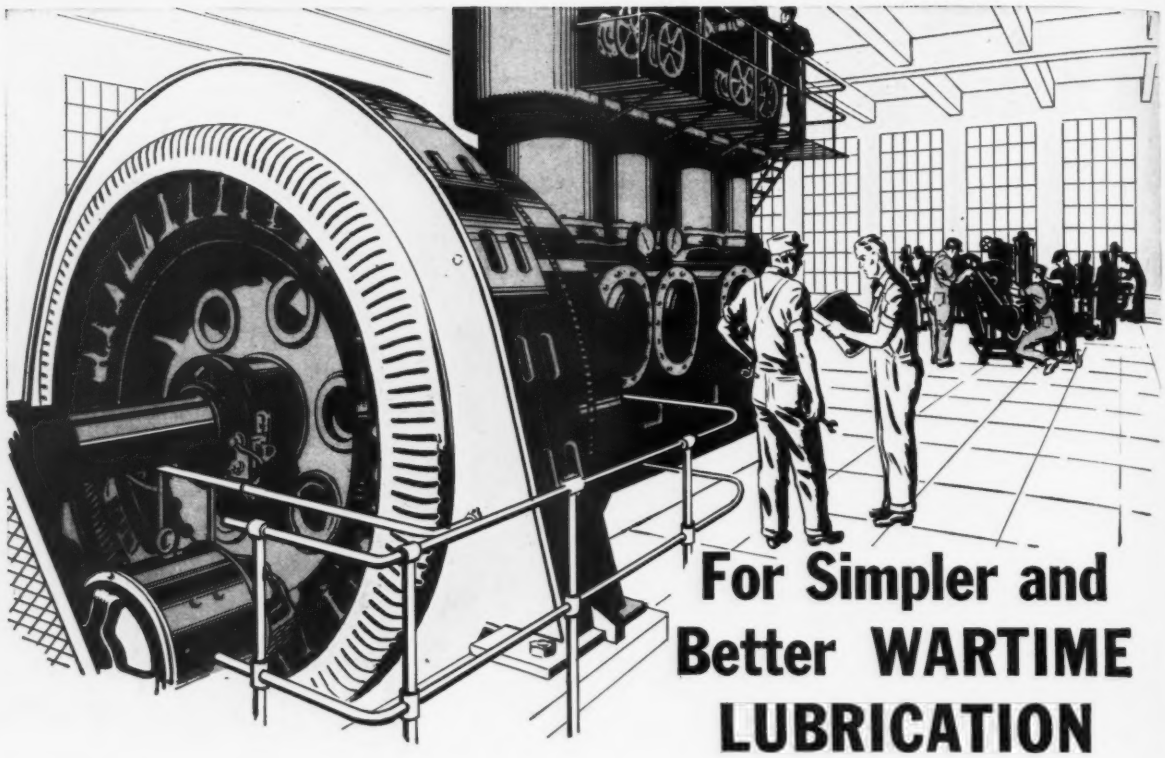


For Simpler and Better WARTIME LUBRICATION

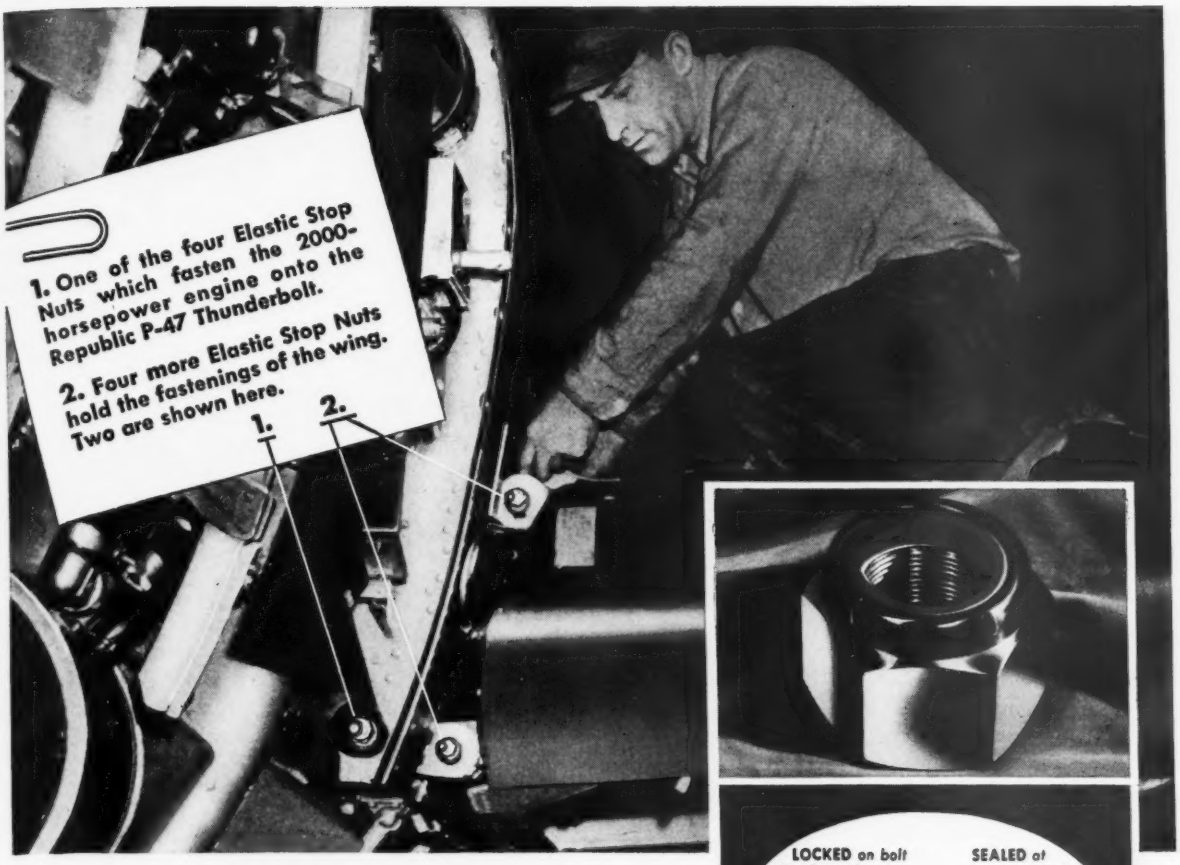
Nothing is too good for a hard-working piece of machinery doing a vital job in wartime. To keep it running, to protect it from needless wear and breakdowns, use of lubricants of the very highest quality is justified.

In busy plants congested with wartime work, many operators are saving time and space, and simplifying purchases, by using higher quality, more versatile lubricants for many purposes. One grease for *all* high-speed bearings, (Cycol Electric Motor Grease) one gear lubricant for *all* gears, including hypoid, (Veedol Multi-Gear Lubricant) are typical examples of broadened wartime use of famous specialized Associated products.

Such simplification of maintenance problems may be advantageous in your plant. There is an Associated Lubrication Engineer in your locality who will be happy to study your problems and advise you, without obligation.

Let's get ASSOCIATED

TIDE WATER ASSOCIATED OIL COMPANY


1. One of the four Elastic Stop Nuts which fasten the 2000-horsepower engine onto the Republic P-47 Thunderbolt.
2. Four more Elastic Stop Nuts hold the fastenings of the wing. Two are shown here.
1.
2.

LOCKED on bolt by the action of the gripping red collar
SEALED at top to protect working threads from corrosion
PLASTIC collar cushions vibration—nut can't shiver loose
FITS any standard bolt. Made in all sizes and types

You've gotta hang on when you say "Giddap" to 2,000 horses

When the pilot of a Republic P-47 pours on the soup, 2,000 surging, throbbing horsepower yank him into the high blue heavens.

When he climbs straight up he is literally hanging on his prop and engine.

And those tons of plane, man and armament hold onto that engine with just four Elastic Stop Nuts.

This is the kind of job that has given Elastic Stop Nuts the reputation of having revolutionized modern aircraft construction. It's the reason you find over 12,000 of them on the P-47 and as many as 50,000 on some types of bombers.

It's all because these nuts hold fast — without auxiliary locking devices. They're applied like ordinary nuts. They can be removed and replaced time and again without losing locking effectiveness. They stay put, and nothing, even violent vibration, shakes them loose.

It's done by the red elastic collar in the top. This collar clings tightly around the bolt threads. It absorbs and cushions vibration from every direction. The nut can't shiver loose — can't turn.

Postwar progress will present countless fastening problems which these nuts will solve. Perhaps you already are studying such problems. If so, let us know about them. Our engineers will be very glad to help work out a solution and show you how an Elastic Stop Nut will provide a safer, surer, trouble-free fastening.

ELASTIC STOP NUTS

Lock fast to make things last

ESNA TRADE MARK

BACK THE ATTACK . . . BUY WAR BONDS

ELASTIC STOP NUT CORPORATION OF AMERICA

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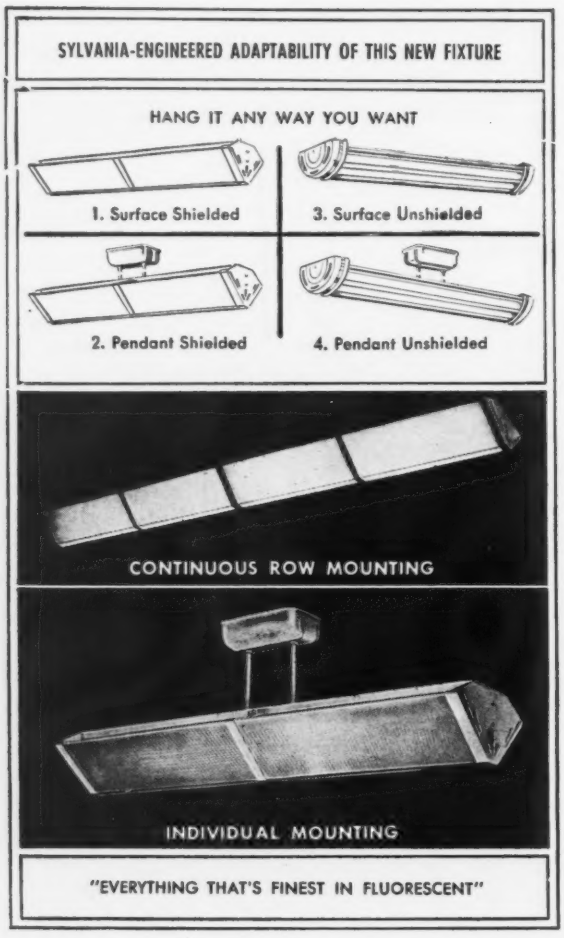
FOR THE FIRST TIME SINCE JUNE 1942

an improved fluorescent fixture

FOR DRAFTING ROOMS AND OFFICES



A RECENT WPB order makes it possible to release this new Sylvania commercial fixture, which offers you outstanding flexibility of installation.

Simple, smart, and modern in design, this new model is ideal for factory offices, drafting rooms, schools, and hospitals.

Its semi-direct light distribution provides real visual comfort through shadowless and glare-free illumination.

Light in weight, easy to install and maintain, it has a relatively small load (200 watts), which is seldom heavy enough to require the rewiring of existing circuits.

And you get a complete, pretested package of light — with 40-watt Sylvania Lamps, Mirastat Starters, and high-power-factor Dualamp auxiliary — completely wired and ready for installation.

This model — unshielded C-200R and shielded C-201R — is available to you on a priority of A-1-J or better, with specific WPB approval required for continuous row installations. It carries Underwriters' Laboratories inspection label and Sylvania's own guarantee. Write for further details, specifications, and prices.

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Ipswich, Mass.

INCANDESCENT LAMPS, FLUORESCENT LAMPS, FIXTURES AND ACCESSORIES, RADIO TUBES, OTHER ELECTRONIC AND ELECTRICAL DEVICES

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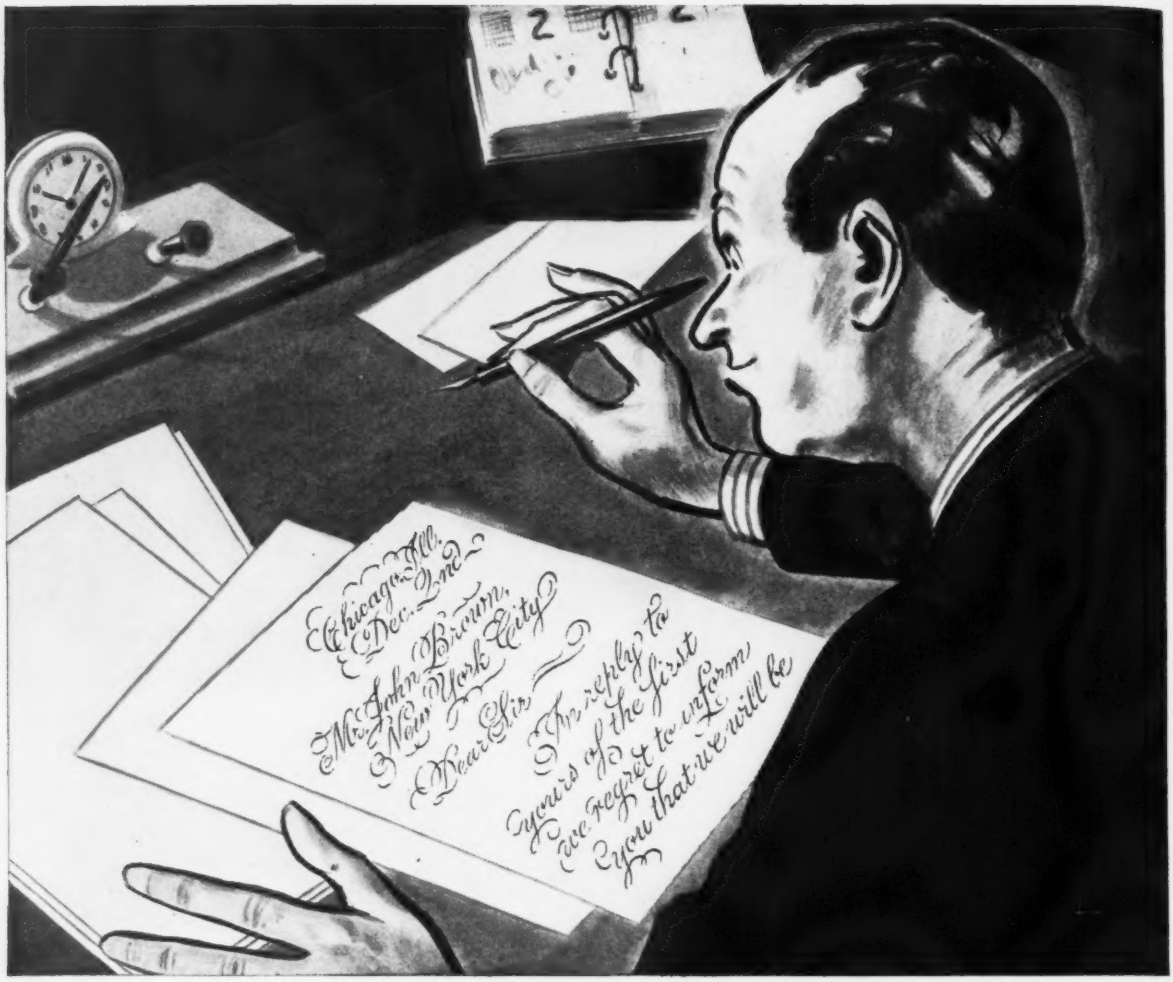

NICE WORK—*but try to get it!*

"He writes a beautiful hand" was high praise for an office employee of the '90s.

But there's no big market today for those elegant flourishes, those delicately shaded lines. They take too long to do.

Modern business demands speed in all its operations. Often, such speed can only be achieved through swift, *repetitive* action—processes that are performed over and over again, quickly and accurately. That's especially true of business records—orders, invoices, shipping forms and the like.

For many years now, Uarco has been helping to speed plant and office routine with better record forms—both autographic register and typewritten. Designed for every department of business and industry, these record forms help to simplify the most complicated operations . . . achieving savings of time and effort which often appear incredible.

Whatever your particular record problem, chances are that Uarco has a solution, or can devise one. It costs nothing to consult with a Uarco representative.

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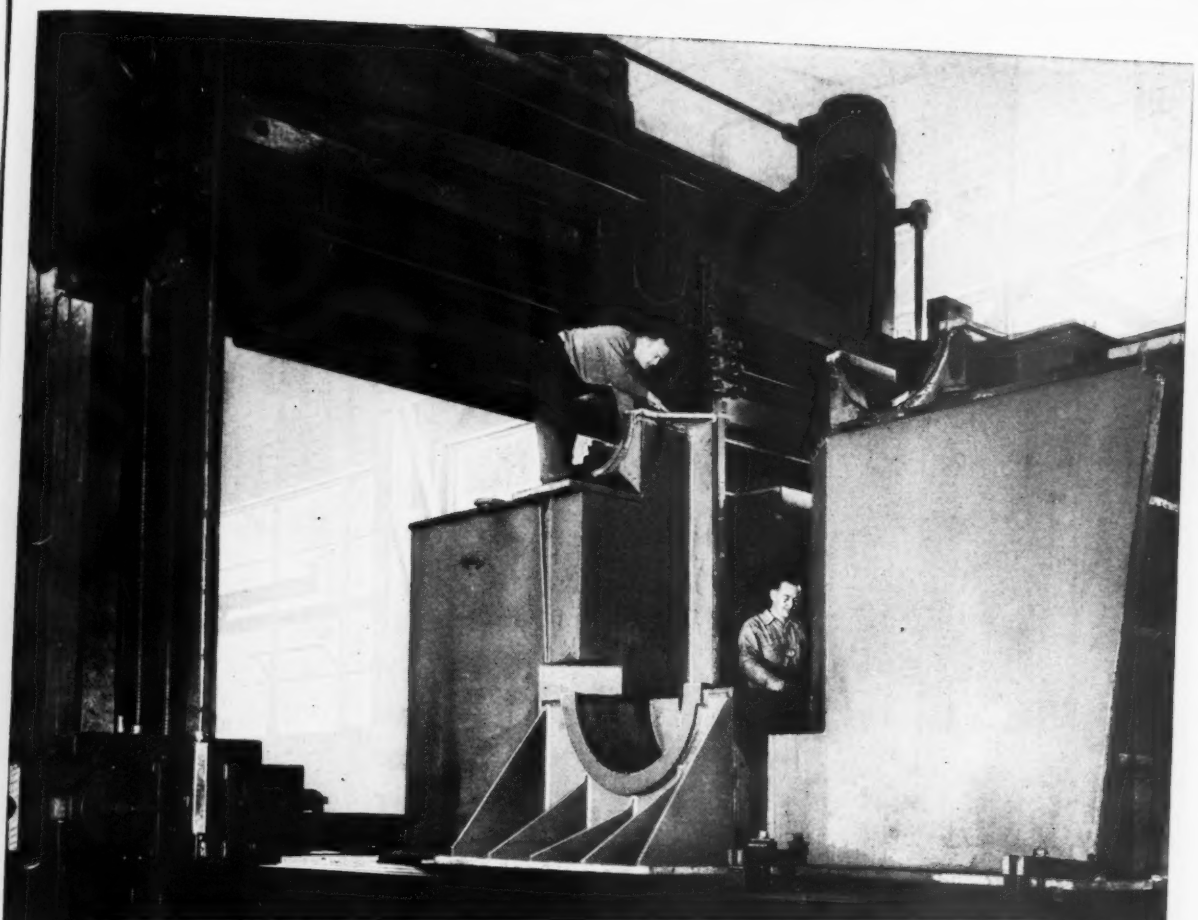
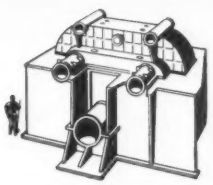


"Barber Chair" FOR A 21-TON GEAR CASE

Here's probably the biggest "barber chair" you've ever seen! And its current customer is a 21-ton gear reduction case for the new 8,500 h.p. Hendy steam turbine units being "shaved" in meticulous thousandths of an inch.

This "chair" is known as a planer and its load capacity of 75 tons on a 510 sq. ft. bed shows the tremendous size of the jobs that Hendy is equipped to handle.

However, this planer is only one unit in the vast array of major equipment that is helping Hendy and its divisions set unprecedented records for turning out massive power equipment with straight-line production methods.



For the Maritime Commission and the Navy Department Hendy production includes steam turbines and reduction gear units up to 8,500 h.p., Liberty and Frigate steam engines, turbo-lighting sets, naval ordnance, hydraulic pumps, motors and generators.

JOSHUA HENDY IRON WORKS

ESTABLISHED 1856

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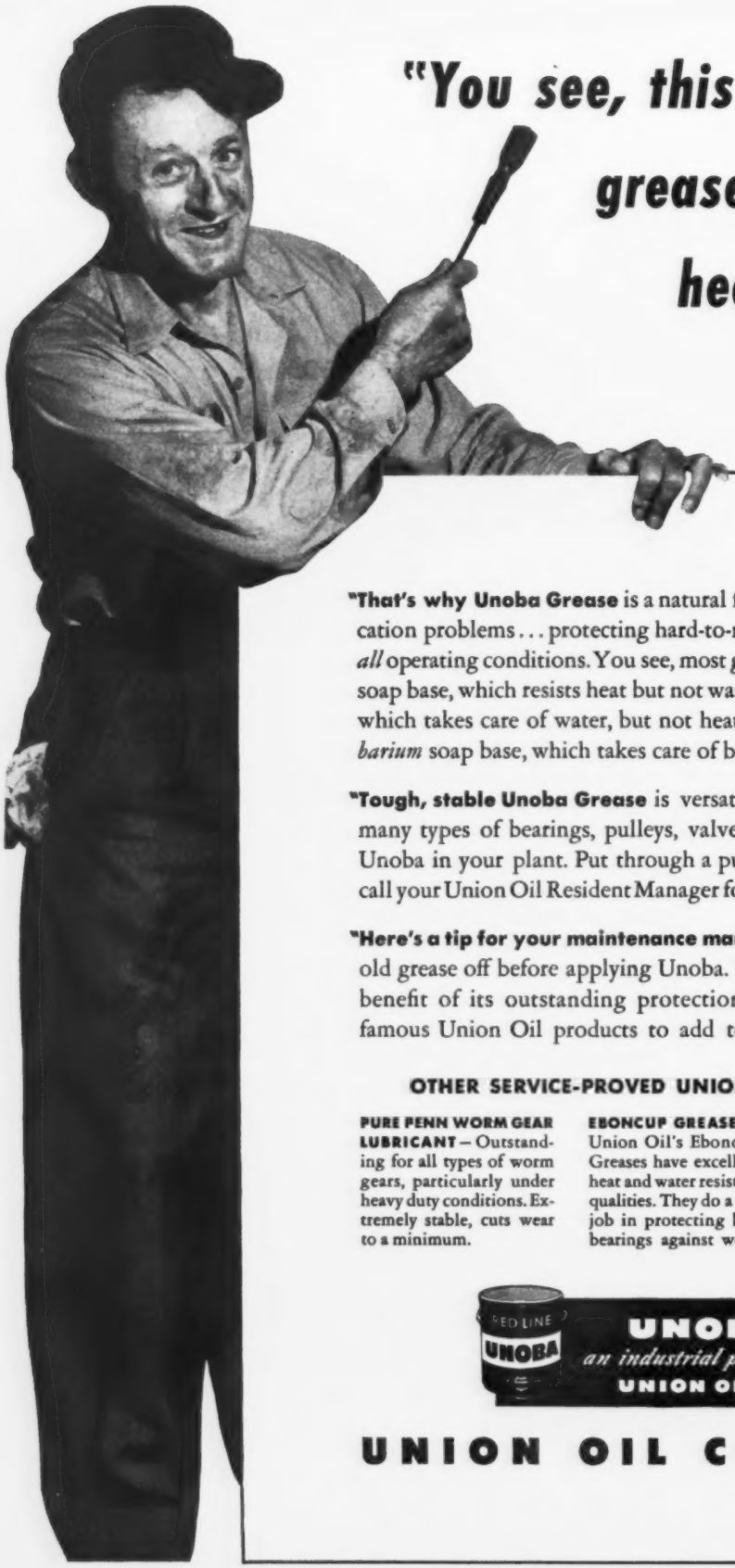


"You see, this barium soap grease resists both heat and water"

"**That's why Unoba Grease** is a natural for all wet and hot lubrication problems . . . protecting hard-to-replace machinery under *all* operating conditions. You see, most greases are either sodium soap base, which resists heat but not water, or calcium soap base which takes care of water, but not heat. Unoba is made from a *barium* soap base, which takes care of both.

"**Tough, stable Unoba Grease** is versatile, too. It's perfect for many types of bearings, pulleys, valve worms, gears, etc. Try Unoba in your plant. Put through a purchase order today, and call your Union Oil Resident Manager for quick, efficient service.

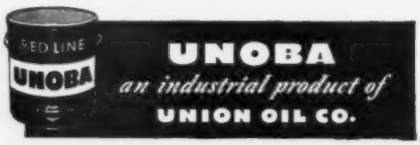
"**Here's a tip for your maintenance man.** Have him wash all the old grease off before applying Unoba. Then you'll get the full benefit of its outstanding protection. See below for other famous Union Oil products to add to that purchase order."

OTHER SERVICE-PROVED UNION OIL PRODUCTS

PURE PENN WORM GEAR LUBRICANT – Outstanding for all types of worm gears, particularly under heavy duty conditions. Extremely stable, cuts wear to a minimum.

EBONCUP GREASES – Union Oil's Eboncup Greases have excellent heat and water resistant qualities. They do a top job in protecting ball bearings against wear.

STOP RUST B–The best internal rust-preventive you can buy. Clings to metal surfaces so well it won't drain off for months. It effectively prevents rust.



UNION OIL COMPANY

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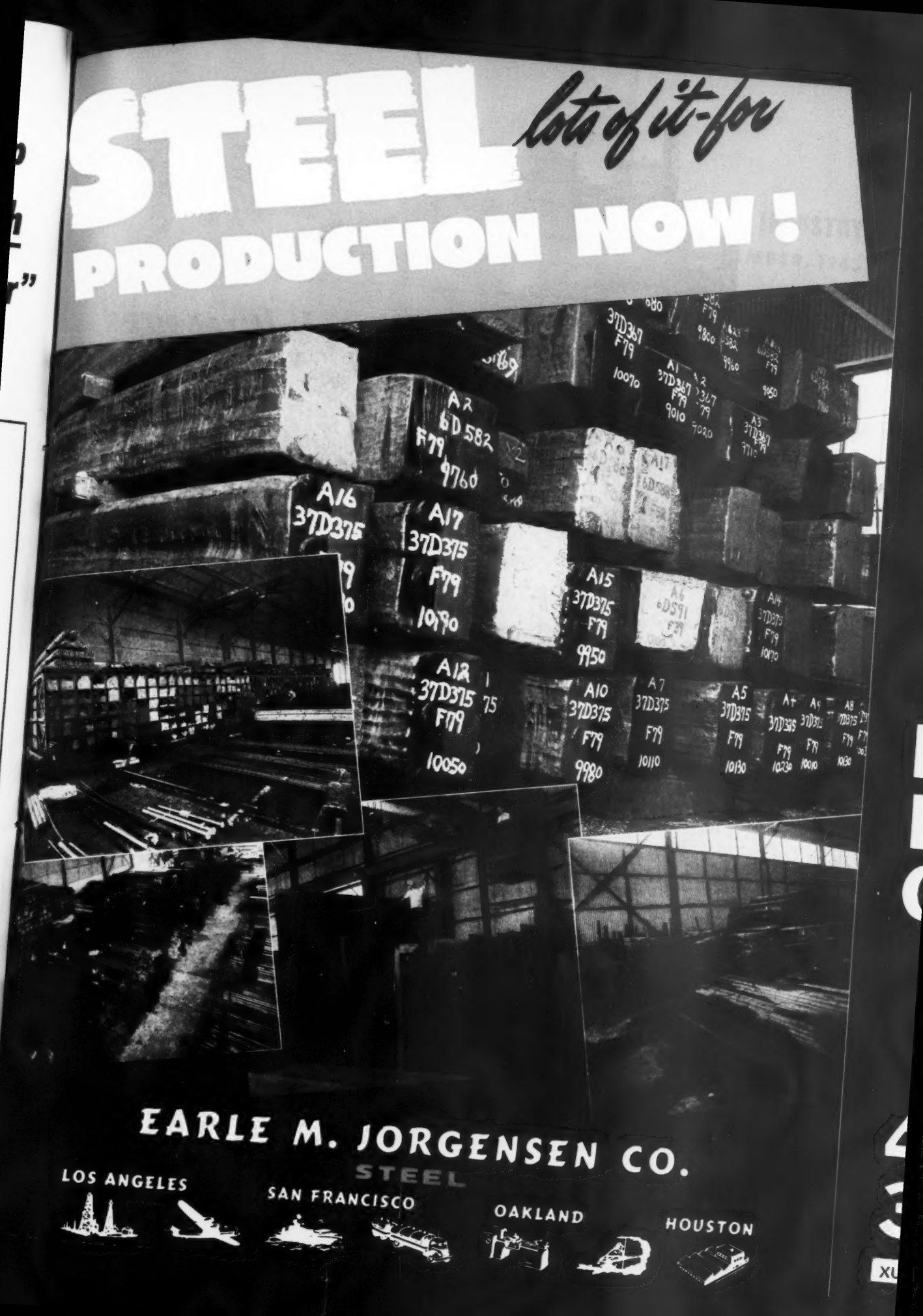
PRODUCTION NOW!



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STEEL

LOS ANGELES

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HOUSTON

Million dollar coal preparation plant at the Victory Mine, Pyramid Coal Corporation near Terre Haute, Indiana, where Indiana No. 3 seam coal is mined. The conveyor from the mine slopes 18° above ground and 16° underground. The conveyor is approximately 700 ft. long of which about 500 ft. is underground. Capacity 600 tons per hour at 375 ft. per min.

Rip ¼ mile long in conveyor belt repaired with FLEXCO HD RIP PLATES and BELT FASTENERS

IN any type of material handling service an unforeseen accident may damage a conveyor belt and result in a costly service interruption unless the belt can be repaired without delay. In such cases Flexco HD Rip Plates and Belt Fasteners frequently save the day.

Such was the case at the Victory Mine of the Pyramid Coal Corporation where a heavy jack pipe inadvertently left in one of the mine cars ripped the 8 ply 48" conveyor belt for a distance of 1450 ft. The accompanying pictures show how the Pyramid Coal Corporation and the local Industrial Distributor restored the belt to service without a serious loss in production. The repair crew had the belt back in service within 30 hours after the accident.

If you operate conveyor belts and are not familiar with the use of Flexco HD Belt Fasteners and Rip Plates you should know about them for they may help you out of a difficult situation. We shall be pleased to send you bulletin F-100.

BULLETIN NO. F-100 gives complete information and prices on Flexco HD Belt Fasteners and Rip Plates with detailed information on how to fasten or repair conveyor belts in any thickness from ¼" and up and in any width.

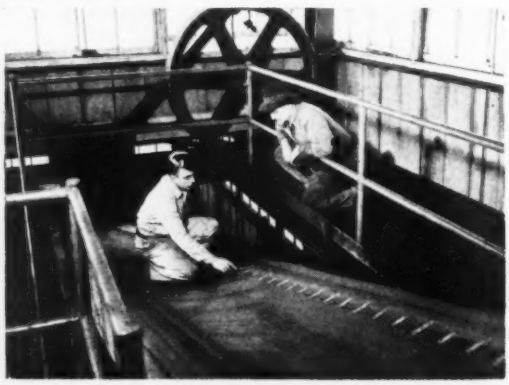
Write for your copy

FLEXIBLE STEEL LACING CO.
4642 Lexington Street, Chicago 44, Illinois

★

Sole manufacturers of ALLIGATOR STEEL BELT LACING for transmission belts • FLEXCO HD BELT FASTENERS AND RIP PLATES for conveyor belts • ALLIGATOR V-BELT FASTENERS • ALLIGATOR BELT CUTTERS

The illustration above shows the crew repairing a portion of the belt where the upper plies ripped and then the tear offset a few inches and the lower plies were ripped. Two rows of fasteners and rip plates were required for repairing this section of the belt. The rip was first "tacked" together every few feet with a rip plate.



The above illustration shows the fasteners and rip plates applied to a portion of the belt where the rip was clean and straight.

Flexco HD Rip Plate

Flexco HD Belt Fastener

In repairing the 48" conveyor belt 4600 Flexco HD Belt Fasteners and Rip Plates, as illustrated above, were used.

Flexco HD belt Fasteners and Rip Plates sold by supply houses everywhere

Spotlight on the NEWS

WESTERN INDUSTRY
FOR DECEMBER, 1943

VOLUME VIII NUMBER 12

$75,000,000 Portland Plan

A $75,000,000 program of public improvement which would employ up to 20,000 men for a two-year period has been recommended to tax levying bodies of the Portland area by Robert Moses, New York City park commissioner. He was recently engaged to draft postwar plans which would ease the transition from war to peace-time economy.

His recommendations include $20,000,000 of new arterials in and around Portland; construction of two bridges and widening of a third; construction of a sewage disposal and treatment system; erection of seven new school buildings; building an 11-block union station and bus depot plaza; development of a 24-block civic center around the present Multnomah County courthouse and Portland city hall; widening of present "bottleneck" Portland streets; further developments of highways and improvement of parks and playgrounds.

Moses expressed doubt that any of the three Kaiser shipyards in the Portland-Vancouver area would be used as large shipbuilding centers after the war, but thought the two Portland yards might be used as ports of embarkation and ship repair yards, while the Vancouver yard might be used for some type of manufacturing, possibly involving aluminum.

Western Pulp Makes Powder

The Pacific Northwest is supplying in the form of wood pulp the basic material for more than one-half of the smokeless powder used as the propellant for all caliber of shells. Douglas fir logging operations used to leave 22,000 feet of sound hemlock and balsam fir on the land. What the once unusable logs on one acre of logged-off timber land will produce in the form of powder is illustrated by the fact that the average hemlock log of 1500 board feet will produce 450,000 rounds for a Garand rifle or five more than 2000 armor-piercing 105-millimeter shells, or five 16-inch naval guns.

Top Flight In War Bonds

California ranks fourth in subscriptions to Series E, F and G war bonds for the fiscal years of 1942 and 1943, according to figures in Senator O'Mahoney's report on post-war planning.

The figures are as follows:

New York	$2,787,646,000
Pennsylvania	1,450,548,000
Illinois	1,331,264,000
California	1,282,216,000
Ohio	1,019,553,000
Michigan	813,190,000
Massachusetts	740,515,000

New Mexico Helium Deposit

The Bureau of Mines has announced discovery of a large deposit of helium in western New Mexico, which it said was equal to or larger than that in Texas.

The deposit was located on the Navajo Indian Reservation near Gallup and officials said test wells had shown a very high content of helium with high pressure.

Hydro Power Demand Up

Shifting of main war centers from Europe to Pacific areas has increased the power-production emergency in the Pacific Northwest, according to Dr. Paul J. Raver, Bonneville power administrator. The Bonneville Agency now has requests before the War Production Board for a seventh generator at Grand Coulee Dam and for storage dams at Albeni Falls in Idaho and Hungry Horse in Montana "which will increase available firm power at Grand Coulee and Bonneville by 10 per cent."

Manufacturing Shifts West

On the basis of the ratio of war contracts to the prewar census of manufacturers reports on "value added by manufacture," the three Pacific Coast states have been doing 13.23 per cent of the nation's manufacturing in the three years from June, 1940, to June, 1943, according to the Los Angeles Chamber of Commerce.

As the three states only had 6.43 per cent of the "value added by manufactures" in 1939, the increase has been 104.8 per cent. The closest approach to this record is the three southwest central states of Texas, Oklahoma, Louisiana. This region had 5.70 per cent of the national total of war contracts, compared with 3.34 per cent of the nation's total of manufactures in 1939, and the gain was 70.6 per cent.

The great prewar manufacturing areas of the nation recorded a sharp reversal of the southern and western trends. Although war contracts in New York, New Jersey and Pennsylvania amounted to 22.98 per cent of the national total, they represented a slump of 22.9 per cent below the regional share in prewar manufacturing. New England's war contracts, at 8.82 per cent of the U. S. total, showed a drop of 10.4 per cent below the prewar manufacturing share.

Aluminum Plant Operating

The $4,500,000 Salt Lake City plant built for the Defense Plant Corporation by Kalunite, Inc., to determine the economic feasibility of producing alumina from domestic alunite ores, is now in operation. The plant is the first one constructed to produce alumina from raw materials other than bauxite.

...AWARD MADE TO
SAN FRANCISCO PLANT

Teamwork Wins — for the war workers of SOULÉ STEEL

THE Navy needed invasion barges to transport our fighting men from mother ship to beach head. A quota was set for Soulé Steel based on the "impossible but necessary." Working as a team, spurred on by a common incentive, to back our fighters, the war workers of Soulé Steel have beaten this quota, turning out these "bridges to victory" in ever increasing numbers. ☆ Today the Army-Navy "E" Burgee flies proudly over the San Francisco plant, signifying Excellence in War Production, a distinction earned by only three out of each one hundred war plants in America. In accepting this coveted Army-Navy "E" Award a challenge is implied to maintain or even excel the record that has won it. ☆ In meeting this challenge, Soulé men and women pledge the same devotion to duty in maintaining war production as our fighting men are displaying at the front... to make the most out of every tool, every machine, every bit of material and every manhour in producing "bridges to victory" so long as there is need. ☆ ☆

You men and women of Soulé Steel are making an outstanding contribution to victory. You have every reason to be proud of the record you have set, and your accomplishment stands as an example to all Americans.

JAMES FORRESTAL
Under Secretary of the Navy

SOULÉ STEEL COMPANY

1750 ARMY STREET
SAN FRANCISCO

Plants also at LOS ANGELES · TORRANCE · PORTLAND

A GOOD SAFE PLACE TO WORK

MISPLACED MANPOWER CRIPPLES PRODUCTION

When Pacific Coast Cities are Being Ransacked for More Help, Thousands of Extra Man Hours Can Be Found Right Under the Roof

By FLOYD RUCH, Ph.D.*
Chairman, Department of Psychology, University of Southern California; Employment Testing Consultant, California Test Bureau

I CONSERVATIVELY estimate that the equivalent in productive capacity of five million able-bodied men and women workers are currently lost to war industry through failure of adjustment between the innate aptitudes of the worker and the requirements of the job. There are enough square pegs in round holes and round pegs in square holes to account for the amount of lost time I have estimated.

Part of them were lost the day they were hired in and placed on the wrong job. Others were placed in training programs for which they eventually demonstrated little or no aptitude and in which they soon lost interest.

Still other potentially productive man- and woman-hours are being lost because high-grade men are allowed to remain in a low job classification, their native aptitudes unrecognized by a busy supervisor.

*Paper read at Southern California Management Conference, October 31.

Let us take a case—a real true-to-life case. Perhaps some of you know this young man, so I will change his name.

The Case of Johnny B.

Johnny B. presented himself for employment at a large aircraft factory and, on the basis of a brief personal interview, was placed as a Junior Detailer. This classification was made despite the fact that the employee's record showed a period of employment as a designer of mechanical appliances with another manufacturer in a different field.

Apparently the impression made on the interviewer was poor enough to discount J. B.'s previous employment record if, in fact, that quota-ridden individual even bothered to examine the record.

After three months as a Junior Detailer, J. B. became dissatisfied and expressed an intention to quit unless a more congenial work assignment could be made. He was told, in effect, by his supervisor that he was hired as a Junior Detailer, and Junior Detailer was what he was going to be.

J. B.'s dissatisfaction increased and eventually he terminated. After leaving the company he was given the following tests by a vocational guidance counselor with the results indicated:

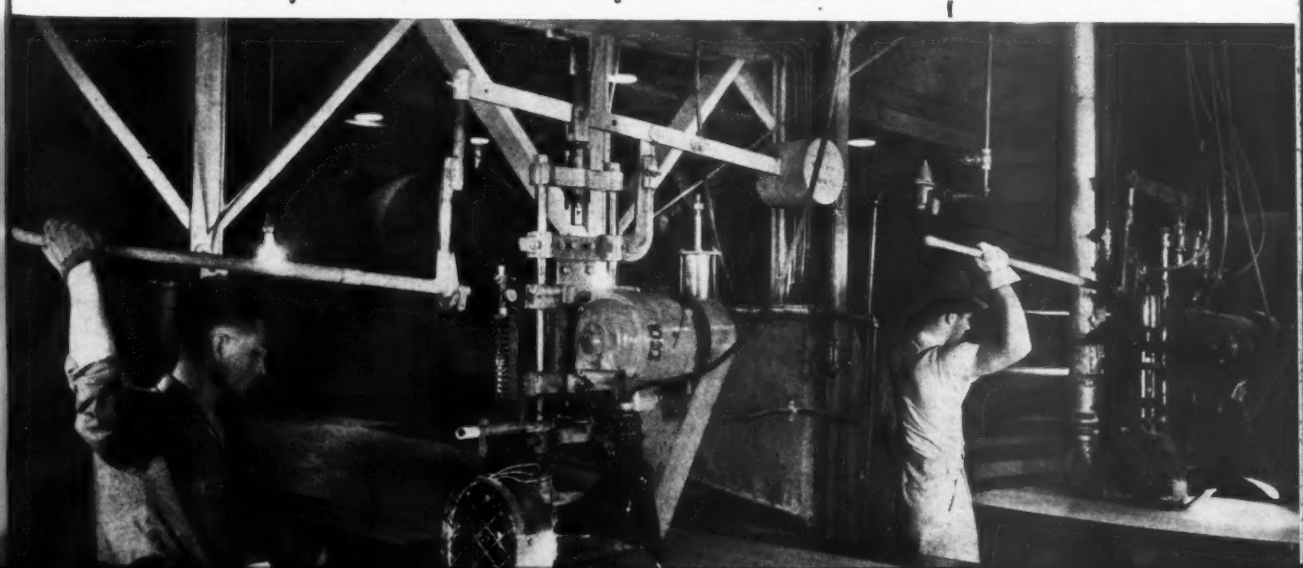
California Capacity Questionnaire, on which he earned a Language I.Q. of 106 (just average) and a Non-Language I.Q. of 148 (genius level).

MacQuarrie Test for Mechanical Ability which showed him to be superior to 99 per cent of adults.

A test of ability to deal with the relationships among objects in space proved him to be superior to 99 per cent of adults.

From these results it was obvious that J. B. is a man who cannot describe himself well in words, but who possesses to an unusual degree the specialized, non-verbal

• Has this Pacific Northwest Douglas fir plywood mill tested these knife operators for ability and aptitude? They cut minor defects from certain grades of veneer sheets. Afterwards egg-shaped inserts are glued into openings.



intelligence necessary in mechanical designing. Had the interviewer in question had at his disposal at the very outset the information which was obtained after it was too late, the serious maladjustment of a valuable worker could have been avoided and there would have been one less replacement to train.

The validity of this analysis is adequately demonstrated by the vocational guidance counselor's follow-up. After a brief period of idleness J. B. received employment as a designer of miniatures in the special effects department of a motion picture studio, where he is contented. This work requires the maximum in designing ability.

If we can assume that motion pictures are as helpful in winning this war as fighters and bombers, we can conclude that the loss to society through placing a high-grade man on a low-grade job was only temporary. There is no escaping the fact, however, that the loss to his first employer was permanent.

Johnny B. is an extreme case, but I can think of several more just as bad. It is the small losses that effect the millions that add to the staggering total of "down time" due to poor job placement in war industry today.

Experience has shown that an efficiency increase of 10 per cent can practically always be brought about through matching the tested aptitudes of the individual to the known requirements of the job.

The Philadelphia Electric Company, for example, brought about a 90 per cent decrease in operating mistakes through the use of psychological tests in the selection of sub-station operators. The Scovill Manufacturing Company developed an apprentice test, requiring 30 minutes per person which accomplished in three days the results previously requiring a whole year of weeding-out.

A representative of the United States Civil Service reports that 93 per cent of appointees selected by psychological tests were more efficient in their work than the previous average. Through the use of tests the Milwaukee Electric Railway and Light Company reduced the percentage of motormen discharged because of accidents from 14.1 to 0.6 per cent in a single year. They were able in this manner to bring about an accident reduction of 81.5 per cent.

This older use of employment tests attempted to find the best man for the job, leaving to the field of vocational guidance the socially significant function of finding the best job for the men. These principles sometimes came in conflict, because it can happen that the best man for the job, once he has been discovered, will in turn discover that the job is not the best for him. Careful follow-up studies of such cases indicate that dissatisfaction soon appears in the individual placed on a job that is not best for him.

Proof of the Pudding

Is a 10 per cent increase in efficiency, without buying a single piece of equipment or hiring more people, worth while? Experience shows it practically always can be brought about through matching the tested aptitudes of the individual to the known requirements of the job, according to Prof. Ruch. Some highly important results have already been obtained in industry in developing greater output, fewer mistakes and less accidents.

The importance of job satisfaction today is greater than it has ever been. Wage freezing in the face of a rising cost of living has crippled the hands of management in dispensing generous financial rewards. The war years yet to come will emphasize the need for intelligent manipulation of non-financial incentives in the interest of high morale among industrial personnel.

Job Adjustment and Employee Satisfaction

The satisfaction which a well-placed worker obtains in doing his job is a powerful stabilizing factor. The Industrial Relations Research Department of Lockheed-Vega Aircraft Corporation has recently completed a study in which an absentee group of employees was matched with a non-absentee group on the basis of equality of job classification, sex, shift, department, and period of employment.

Comparison of these two groups showed that the proportion of individuals placed on jobs which did not fit their demonstrated aptitudes and abilities was significantly higher in the absentee group than in the non-absentee group. To neglect this important factor amounts to sabotaging the war effort and the balance sheet as well.

If further evidence of the value of adjusting the abilities and aptitudes of the worker to the requirements of his job is needed, it may be found in a recent Gallup poll. The American Institute of Public Opinion sounded the ideas of war workers themselves on the question of plant efficiency by having their interviewers talk to workers in New England, the Philadelphia-Baltimore area, the Buffalo-Cleveland area, the Detroit area, and in the industrial communities of California.

Workers were asked the following question: "What do you think is the greatest mistake that your company makes?" Tabulation of results showed that as many respondents mentioned the hiring for certain jobs of workers whose abilities were not suited to those jobs, as mentioned unfair wages and lack of a proper pay-scale for different types of work. No more conclusive evidence of the value of job adjustment can be demanded.

There is no good and sufficient reason why serious maladjustments between the abilities of the worker and the requirements of the job should exist in war or in peace. Any large industrial organization tends to be a little world in itself, which provides employment at a wide variety of jobs in the office and in the works. In an aircraft factory, for example, there are over 350 job classifications representing a wide variation in abilities, aptitudes, and interests required for their successful performance. There is a job for every one. It might just as well be one he can do.

Employee Testing as Insurance For the Postwar Period

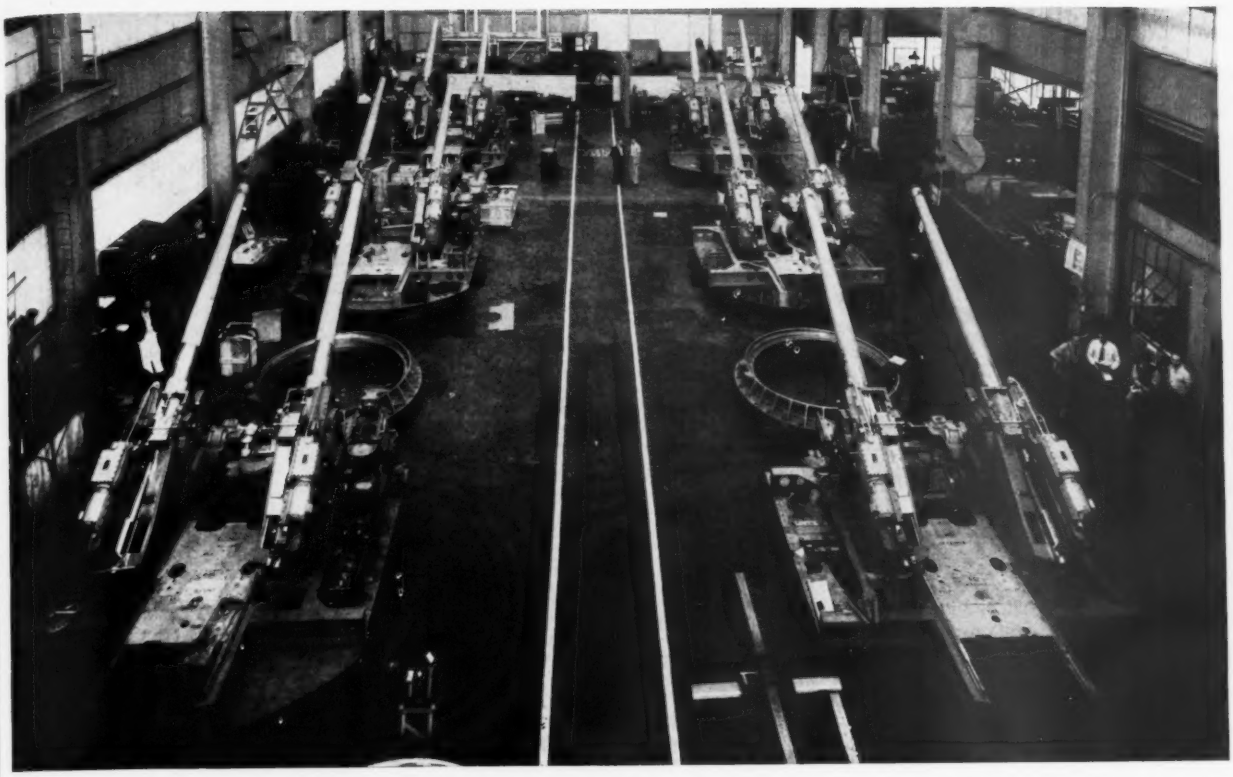
Subscribers to United Business Service will recall that in his report on May 8, 1943, Paul Talbot hailed the scientific measurement of human aptitudes, abilities, and personality as a basis for vocational guidance within industry as another step toward a better postwar world.

This is the studied opinion of a man who has no axe to grind other than being right in the advice and information offered to the business world. We Americans have recently learned to our sorrow that in time of peace, we should prepare for war. We have learned the hard way. The obvious moral is that in time of war, we should prepare for peace.

Through the use of standardized tests, management can set up ability standards and specifications which will permit the reduction and readjustment of oversize payrolls to meet the reality of an economic system which will have become competitive again. Reducing the complexities of our anticipated postwar reconstruction to almost absurdly simple terms, we discover that management will operate under the principle of retaining on the payroll the best of the present number of workers, whereas the unions will probably insist on retaining as many of the present number as they can.

No matter how smooth the wartime relationship between management and the union might have been in a particular organization, when both were drawn together by the common desire to restore a free world, it is inevitable that tensions of a more or less serious nature will develop during the postwar period. The more facts that management can present to justify the retention of one employee and the laying off of another, the less the friction which will develop.

Standardization test results are objective and impartial and therefore tend to bolster the credibility of merit ratings which, valuable and necessary as they are, suffer the frank limitation of being somewhat subjective. More progressive union men welcome the factual approach. One union representative of my acquaintance characterized merit rating systems as he knew them, and he knew them well, as "an attempt on the part of management to perpetuate eternally the solidified prejudices of line supervision." When facts come in the door, emotion frequently climbs out the window.



• **ANTI-AIRCRAFT vs. AIRCRAFT—Five-inch rapid-fire twin mounts, 12 shells a minute, built at Consolidated Steel Corp., Los Angeles.**

Aircraft Shortage Is In Direct Productive Workers

PACIFIC COAST aircraft factories are hiring more than enough men and women to meet manpower needs. . . . Pacific Coast aircraft factories are short on manpower.

One word explains that apparent contradiction.

That word is "turnover."

Biggest and most persistent obstacle in the way of maintaining the steady production increase that will meet aircraft schedules, employee turnover is daily costing manhours enough to build many urgently needed planes and its effect is felt throughout the industry.

It is expected that, as the West Coast Manpower Program moves into high gear, the system of controlled referrals will materially reduce indiscriminate quitting, but many problems still remain, which must be solved before the present rate of 22,000 replacements each month because of turnover can be effectively cut down.

Aircraft men hope the figures for the last half of the year will show a marked improvement over the first six months of 1943, when, according to a survey by the Aircraft War Production Council, the Pacific Coast companies hired 150,435 new employees, but at the end of the period had only 20,291 more workers than at the beginning.

It must be remembered that the worker loss represented in the difference between the 150,435 new hires and the 20,291 net increase at the end of the period means much more than one man or woman or any number of men and women leaving the job and others taking their places.

Because of the scarcity of workers already trained in mechanical skills, virtually all new employees require more or less training. Some are entirely inexperienced and must learn to use their tools. Some have had pre-factory training, but have never worked as members of a crew and under factory conditions. Even those who have had factory experience must learn individual plant methods and routine. All this, a by-product of turnover, means delay in production while the new workers are being fitted into the factory picture.

Why the Turnover?

This article, prepared specially for Western Industry by the public relations department of the Aircraft War Production Council, gives a clear picture of the problem the airframe factories are facing and the constructive steps that are being taken to reduce turnover.

One factor in the manpower situation that the employers realize only too well, but that has escaped public notice, is that the vitally serious shortage is in "direct productive workers"—the men and women who actually build the planes.

Of this, T. C. Coleman, vice president of Northrop, said recently:

"The aircraft industry's manpower problem is not one of numbers of employees so much as it is one of types of employees. What we need is direct productive employees. It would be fairly simple to hire the 22,000 replacements necessary each month because of turnover if we were concerned only with numbers.

"Most of the applicants at aircraft plants

want to be executives, clerks or expediters. America still has the white collar complex.

"The present trend on total numbers of employees has leveled off so that, while we are not gaining much ground, we are not losing, but the trend of direct productive employees continues downward and causes us great concern.

"Generally speaking, we have all the indirect or so-called non-productive employees that we need. This situation causes misunderstandings at times, and people who apply for aircraft employment for patriotic motives but refuse or are not qualified to take productive jobs, may leave the employment office with the mistaken idea that additional workers are not needed in the aircraft industry."

Testifying before a House Naval Affairs sub-committee, John C. Lee, Aircraft War Production Council manager, put his finger on the same difficulty when he said:

"Numbers, although the most popular, are unfortunately not the best gauge of manpower requirements. The current problem in the Pacific Coast plants is not numbers of employees but numbers of direct factory employees. The trend in direct employees has been constantly down for six or seven months, and there is presently a definite shortage in most plants of direct workers. At the same time, the available new employees are, in large measure, those who will not accept or are not suited for direct factory work."

Analysis of the turnover problem, as it affects the general manpower situation, shows again and again that it is not as simple as John Doe quitting his job and being replaced by Richard Roe.

In the early stages of the aircraft industry, and even during the expansion of 1939 and 1940, a majority of the workers were young men, mechanically inclined, usually more or less familiar with tools and machines, and frequently attracted to the industry by career possibilities.

Young men, and the first women to enter the aircraft field, became aircraft workers because they were interested in airplanes, wanted to be around airplanes, and intended to stay in airplane building.

WESTERN INDUSTRY THANKED

(Comments on Western Industry's leading article in the November issue, entitled "Manpower's Output Must Match Battle's Wastage.")

DONALD M. NELSON

Mr. Nelson has asked me to acknowledge and thank you for your letter of November 5 and the attached tear sheets from your November issue. He was interested in reading the article on the manpower question and appreciated your bringing it to his attention.—L. Thornton, Secretary to Donald M. Nelson.

NAVY SECRETARY KNOX

The Secretary has asked me to thank you for sending the tear sheets of the lead article in the November issue of Western Industry. He was very favorably impressed with the manner in which this question is presented in these tear sheets and predicts that the results will be constructive.—John H. Dillon, Major, U.S.M.C., Marine Aide to the Secretary.

WAR MANPOWER DIRECTOR

Your presentation of manpower needs in terms of the destructiveness of battle is indeed a graphic one. My thanks for forwarding the tear sheets.—Paul V. McNutt.

GEN. GEORGE C. MARSHALL

General Marshall has asked me to reply and to thank you for your letter of 5 November with its attachment relating the West Coast manpower problem to actual combat losses. Your approach, in my opinion, is both realistic and helpful.—W. D. Styer, Major General, G.S.C., Commanding.

Today, aircraft factory employment is, for a large proportion of the workers, frankly and understandably a war-inspired and temporary job. Thousands of them do not expect to stay in the industry after the war; therefore, they are, naturally, more susceptible to such influences as overestimation of their suitability for the work in originally accepting the job, the appeal of other work which may be equally war-important but more interesting or easier, personal matters, and, in many cases, the recurring spurts of public belief that "the war will be over in a few months."

Aircraft industry leaders emphasize that this statement of a change in employee type is in no sense a criticism of the many thousands of loyal and hard-working men and women who have cheerfully sacrificed their personal affairs to work in the factories, but that it expresses a result inevitably produced by the general manpower situation, by the heavy drains from the armed services and other industries upon the normal supply of young men, and by the sudden and vast expansion of the aircraft industry demanded by the war.

As the manpower needs of the aircraft industry became acute at the same time that the available supply of manpower was being steadily and rapidly reduced, it became necessary for companies to engage in or vastly expand the active recruitment of workers.

Where, a few years ago, an applicant for a job, already "sold" on the idea of aircraft work, sought out the factory, the situation now is reversed; the factory seeks the workers and has to sell the job to them. It has been necessary to waive many requirements, to ignore, in large measure, the matter of experience, to take on thousands of workers who were frankly uncertain of their ability or the likelihood of their staying on the job.

Many of these sought-after workers have proved their permanent worth; many others, however, have, for one reason or another, dropped out after a few weeks or a few months.

Employees with relatively little experience account for most of the general turnover, and, inasmuch as these initially inexperienced employees are increasing in proportion to qualified and trained personnel, the high rate of turnover is multiplied.

The changed make-up of employee strength in the Pacific Coast aircraft fac-

• LOS ANGELES AREA PRODUCTION URGENCY COMMITTEE. Left to right: Lt. (j.g.) A. R. Murray, (observer) USN Procurement Office; Lt. (j.g.) L. F. Shebel, (observer) USN Bureau of Aeronautics, Washington; Wade E. Sherrard, Office of Defense Transportation; Col. Wm. J. Brennan (observer), War Dept., Washington; Lt.-Col. Robson English, C.W.S., rep. all technical services of the Army; L. M. Dreves, WPB, chairman; O. K. Fjetland, WMC, (Chairman of Manpower Priorities Committee); R. O. Boynton, exec. secretary; Roy Stockton, Maritime Commission; W. H. Cotrel, Petroleum Administration for War; Charles J. Kennedy, War Food Administration; Lt.-Com. Edward Veitch, Navy representative Aircraft Resources Control Office; Capt. F. M. Earle, Navy Department.

tories—a major factor in turnover—is shown in surveys conducted by the Aircraft War Production Council.

According to this survey, the aircraft industry today employs a higher percentage of women than any other major war production industry, and, among airframe builders, the Pacific Coast plants employ more women proportionately than do airframe plants in other areas.

For June 1943, the coast airframe plants employed 43.5 per cent women, while the national figure was 38.6 per cent.

The bulk of the present working force in western aircraft plants is composed of:

Women	43.14%
Men between 18 and 37	33.74
Men over 45	10.76
4F men	2.56
Boys under 18	1.40
Men unclassified	1.01

Of these groups, the women and men over 45 (53.90 of the total) are a new type of employee, principally brought into the plants by war demands, and more likely to terminate employment because of insufficient physical stamina, work unsuitability, health or personal reasons.

Boys under 18 are regarded as temporary employees, vulnerable under the draft as soon as they become 18, since they are obviously not key workers.

A study of termination causes for more than 100,000 employees leaving the eight Council member companies during the period January-June 1943, shows:

Personal affairs	42.71%
Working conditions	18.07
Military	14.92
Health	13.55
Dismissals	7.13
Living conditions	3.62

Of these terminations, 18.54 per cent may be directly attributed to the war; military causes obviously because of the war and living conditions, such as housing and transportation, also being attributable to war circumstances.

Breaking down the totals, the chief reason for termination—aside from health and military causes—is "moving out of town." Where pre-war employees were drawn largely from the areas about factories, the war, bringing in its train an enormous demand for labor, higher wages, and the patriotic desire on the part of many persons to do war work, has stimulated the flow of semi-migratory labor into the aircraft-producing areas. Without permanent home ties, this group is apt to move on, impelled by a variety of reasons; the appeal of a different job, financial betterment, the chance of better living conditions.

In order thereafter, the principal reasons for termination are "unsatisfactory job"—many times meaning work unsuitability—"to get married," "returning home," transportation difficulties, and "better job."

All of these may be linked to the increase of the changed type of employee.

Efforts to halt turnover are a major activity of every aircraft company. Every plant maintains a complete industrial relations department to analyze the cause of labor turnover and to seek to promote the good employee relations which are the best guarantee against a constant outflow of workers.

As a rule, this activity begins with the induction interview in which efforts are made to place the new worker where he or she will be best suited. In some plants, new workers are taken on tours through the factory, and recently there has been an increasing effort to show new employees just how their particular work will fit into the completed plane. The purpose of this, of course, is to establish the feeling that the especial detail with which the worker is concerned is an important factor, thereby developing pride of workmanship, appreciation of the necessity for care and accuracy, and interest in the work beyond the moment.

Once employed, the worker has the opportunity to participate in a wide range of employee service programs, extending from financial aid in emergencies and income tax service to shoe repair and laundry service on a schedule considerably faster than the average citizen can find available. Pacific Coast companies offer a total of 88 separate services for the benefit of employees, generally divided into recreation, transportation, credit union facilities, financial aid and advice, housing assistance, legal counseling, cafeterias and canteens, medical services, insurance, stores, and personal services.

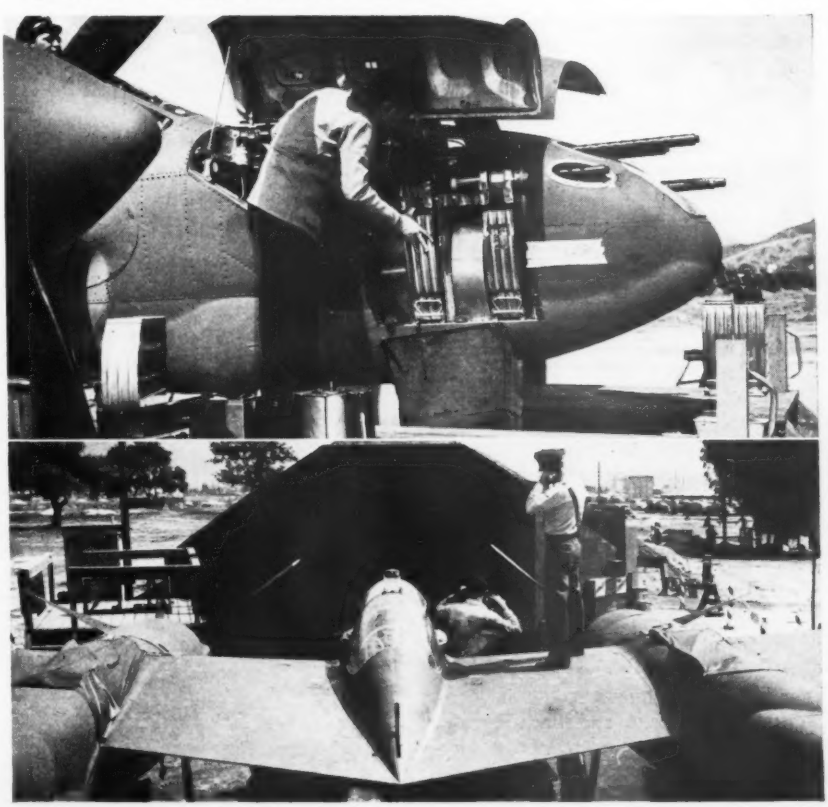
Employees are given the opportunity to advance through study and class training; initiative is encouraged by awards for work-improvement suggestions.

In the case of employees expressing a desire to quit the job, the traditional reply of "All right, go get your time," is banned. Every employment termination means three general steps, all directed toward keeping the worker on the job.

First, a serious appraisal of the employee's problems and reasons for quitting is attempted, and an effort is made to persuade the employee of his part in the war effort. The primary object here is to determine what further effort shall be made toward "salvage."

If the employee's record indicates that salvage is worth while, a complete attempt

• Last test of Lockheed Lightning P-38's is firing the five gun muzzles, four closely grouped .50-caliber machine guns and one 20-mm. cannon, into testing tunnel, a thick, concrete, earth-covered tube about 58 feet long and 5 feet wide, flaring in an even slope to a 10-foot width at its mouth to funnel inward any possible stray shots. Top photo: Checking armament magazines on P-38 at firing range. Lower photo: Man in cockpit prepares to fire into tube.



is made to re-sell the job, pointing out possibilities of advancement, discussing whether or not transfer to another department will help, and generally talking things over.

If the employee still maintains a desire to leave, decision is made as to whether or not a statement of availability shall be granted, and upon departure an expression of the company's appreciation of the employee's service is extended.

Results of this effort to keep the worker on the job have been reasonably satisfactory. High percentage of "salvage" is reported by North American, which, in successive weeks ending in September, retained from 26.58 per cent to 31.74 per cent of the workers expressing a desire to quit. Lockheed has averaged 15 per cent, Consolidated San Diego, 18 per cent; Ryan from 15 to 20 per cent; Northrop from 12 to 15 per cent, and so on.

While many terminations are for unavoidable reasons, many others are due to causes which the community, including other industrial and business interests, can help to eliminate. Such problems as housing, child care, essential family services, opportunity for workers to market and shop before or after working hours, and transportation are all matters for public co-operation.

The problem of turnover is being met, therefore, in a variety of ways, the combination of which, it is hoped, will relieve the aircraft industry of one of its most serious difficulties and stimulate the production of war planes.

First is the more positive control of employment and labor migration through the operation of the West Coast Manpower Program with its system of controlled referrals, employment ceilings, statements of availability and the like.

Second is the organized activity by employers, co-operating with responsible employee groups and representatives, to remove those causes of turnover which are within employer control.

Third is the constant and growing effort to develop a full understanding among plant workers and the general public that the urgent demands of the armed forces for planes can be met only if the productive forces are not only increased but maintained.

Child Service Centers

Child service centers built at a cost of $350,000 each have been opened at the Swan Island and Oregon Shipbuilding Corporation yards at Portland. At Swan Island the day shift schedule included breakfast at 7:15 a.m. and lunch at noon, with supervised play and rest periods between meals. The capacity there is 400 youngsters for each shift.

Better Tone to Coast Manpower Situation

Imposition of labor ceilings all along the Pacific Coast has begun to bring manpower demand more closely in line with supply, and in various areas the Manpower Priority and Production Urgency committees have reason to feel that the shortages will be met. The success of the West Coast Manpower Program is attributed largely to the fact that it is being handled by local committees, thus making it a community effort.

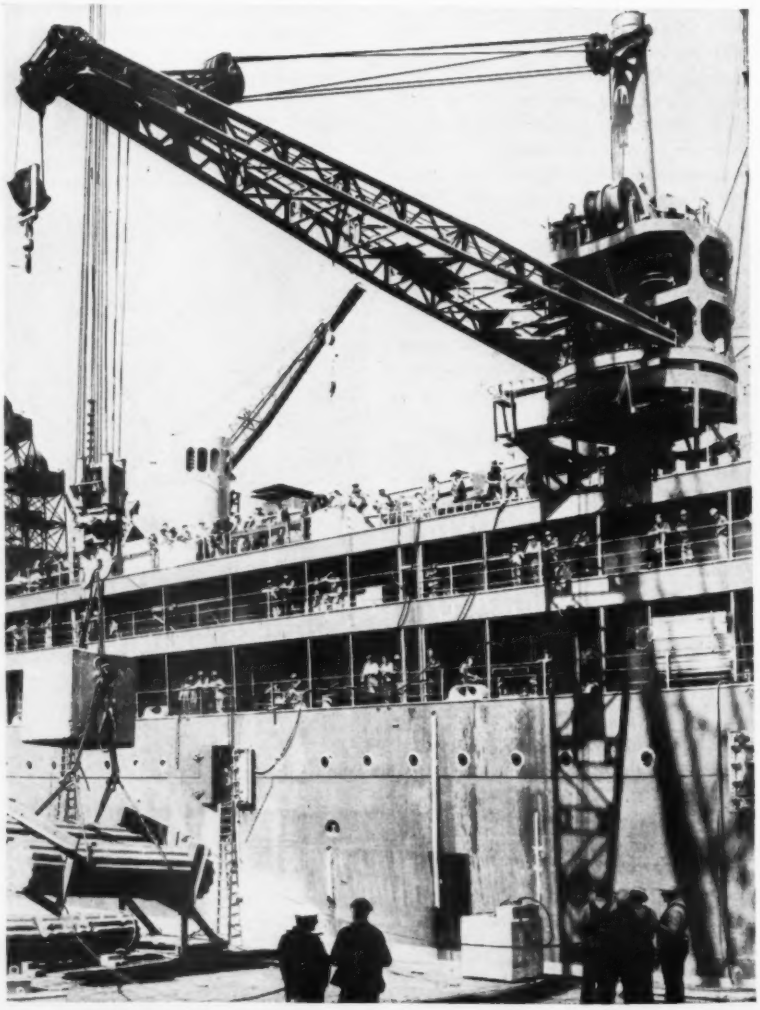
Close scrutiny by the procurement offices of the operations of their contractors has resulted in scaling down demands, in contrast to the former method of asking for more men than were needed in the hope of getting at least a partial supply.

In a period of three weeks in southern California the U. S. Employment Service was able to send 12,000 workers to priority plants as a result of the labor ceilings imposed on less essential industries.

Meat packing plants have been a difficult problem, on account of the relatively low wages paid, and in the last six months the U. S. Employment Service has sent them enough new labor to restaff them three times. They have been given higher ceilings to provide an opportunity for meeting their labor shortage. Railway industries also have had ceilings lifted, as they were especially short of men.

Aircraft plants and shipyards are reported catching up on schedules, where they had previously been behind. Airframe plants had a net over-all gain in employment for October of 3,423 workers, and were able to set a new high record of 8,363 planes, an increase of almost 800 over the previous month.

• BOAT AND AIRPLANE CRANE, undergoing tests on submarine tender at Moore Dry Dock, in Oakland. Built by the Western Gear Works, its main winch which tops and lowers the boom, its boat winch, airplane winch and rotating machinery all are mounted on a series of three rotating platforms mounted upon and revolving about a fixed vertical king post. Its operation is as simple as driving an automobile under ordinary conditions.



Airview of the O'Mahoney Western Post-War Survey

A BIRD'S-EYE view of what Senator O'Mahoney of Wyoming learned through his recent hearings in the West as a member of the Senate Committee on Post-War Economic Policy and Planning is given in a report to the senator by James McI. Henderson, chief of the West Coast offices of the anti-trust division of the Department of Justice.

Mr. Henderson's reaction to the hearings were summarized as follows:

(a) Industry showed considerable reluctance to appear, primarily because of the fear of revealing their post-war plans prematurely and partly, because many of them may lack any concrete plans for the post-war period; (b) labor, in general, favored a sufficient governmental participation by financing and necessary control to insure full employment at fair wages for all persons able to work, particularly those returning from the war and those persons who have moved into war centers, taking what must necessarily be considered as temporary war jobs.

The chambers of commerce, which of course represent businessmen and other sections of a civic society, in each of the cities visited, had given considerable thought to the problem of post-war employment. One of the best examples of this was Eugene, Ore. where taxes had already been imposed to raise a substantial fund ($5,000,000) for a public-works program in the city of Eugene.

The Chamber of Commerce of Los Angeles took a more realistic view of the situation and had developed a public-works program to some extent. The machinists' union in Los Angeles had a very outspoken and intelligent leader at the meeting. He was forthright in his advocacy of necessary Federal aid to obtain full employment.

In San Francisco the "work pile" plan was originated and has been adopted by the Chamber of Commerce. This appeared to be an extremely intelligent approach to the problem and seemed to go into the necessary detail to insure a program of private enterprise sustaining itself by its own efforts during the post-war period. One of the items was a probable expenditure of approximately $45,000,000 by the railroads in the San Francisco area.

In Portland the meeting indicated a desire for a stop-gap public-works program financed in part by the federal government but locally managed; that federal participation in business be withdrawn as speedily as possible to insure a protection of free enterprise; that protection of small businesses be assured by enforcement of the anti-trust laws; abandonment of the limited production high-unit-price philosophy; full cooperation of industry, labor, agriculture, and Government to attain and maintain full employment.

Oregon and Washington people are vitally interested in the development of a light-metals industry on the coast. Their point of view is that such industries have been basically established by the federal government during the war emergency and that they should be carried on after the war by private industry.

They rely on the cheap-power argument to justify the existence of these industries on the coast and point out that even the maximum production of aluminum, for example, would amount to only 2½ per cent of the total production of steel, and that it would not seriously compete with the steel industry but would be more or less of a new development of the uses for light metals.

It is interesting to note, when Mr. Peyton of Seattle testified in this connection, that the use of the light metals increases in geometrical progression to price decreases; that the State College in Washington is experimenting with change-over from steel and cast iron to castings of lighter metals for use in, for example, farm machinery, bearings, etc.

The chamber of commerce advocated that an alumina plant be built on the West Coast near the present plants, and that explorations for various aluminum-ore deposits in the western part of the United States be undertaken.

One of the interesting points of the Portland meeting, incidentally, was the testimony of Walter W. R. May, of the General Electric Co., who advocated the creation of a heavy industry on the West Coast and supported the construction and operation of the Bonneville Dam by the Federal Government. He suggested that an amortization loan plan be set up to finance these industries.

In Portland it was also suggested that additional Webb-Pomerene associations might be set up to combat foreign cartels. This suggestion, of course, gives some concern.

It was interesting to observe that the chambers of commerce recognized that there would be a surplus of bottoms available for foreign shipping, and it was fairly well recognized that the United States would dispose of some of these bottoms to foreign countries. It was recommended that the slower Liberty ships be sold to foreign shippers and that the faster ships be disposed of to United States interests. In respect to shipping, it was further advocated that the Government establish a refrigerator line from the West Coast to England via South America and the Panama Canal. Other refrigerator lines to the Indies were also advocated.

Lastly, I observe that all up and down the coast the businessmen and chambers of commerce and even some of the labor men advocated a tax program designed to permit businesses to build up reserves to be used for repairs and reconversion to peacetime production.

Another slant on the testimony offered

Pacific Coast Steel Consumption — 1937 and Postwar and Steel-Mill Capacity

(Prepared by Bernard E. Etcheverry, market analyst, Kaiser Co., Inc., iron and steel division)

(Thousands of Net Tons)

	1937 Consumption	Estimated Postwar Consumption under Various Conditions					Steel Mills Capacity
		Normal	Extremely Favorable — Present Industries	Extremely Favorable — New Industries	Extremely Favorable — Export	Extremely Favorable — Total	
Semifinished products	18	22	24	.....	.....	24	.....
Concrete reinforcing bars	150	185	202	.....	2	204	330
Other merchant mill prod.	163	202	219	126	20	365	512
Standard structural shapes	87	107	117	33	19	169	425
Plates	185	229	249	58	54	361	906
Subtotal	603	745	811	217	95	1,123	2,173
Special sections[1]	41	51	55	.....	.....	55	.....
Railroad products	154	190	207	.....	22	229	40
Tubular products	381	470	512	13	32	557	.....
Wire products	174	215	234	16	29	279	105
Sheet and strip	346	427	465	263	43	771	157
Tin plate	400	494	538	.....	58	596	([2])
Other	30	37	40	25	.....	65	.....
Total	2,129	2,629	2,862	534	279	3,675	[3]2,507

[1]Wide flange sections and sheet piling.
[2]Assuming that the tin plate facilities at Pittsburg will be idle or abandoned since they are now obsolete.
[3]Includes 32,000 tons of bolts, nuts, rivets and forgings, which are not considered as steel-mill products.

was given by Hugh B. Killough, industrial consultant of the Department of Labor, who footed up a long list of suggestions offered for dealing with post-war unemployment. He also stressed the fact that the absence of testimony from private industry was no sign that plenty of attention is not being given to post-war planning by individual concerns.

His comment was, in part, as follows:

Representatives of individual business concerns offered less testimony at the hearings than representatives of state and local governments, labor unions, chambers of commerce, and other organized groups.

This fact does not imply that individual business concerns are not giving serious thought to postwar problems, but rather that individual business concerns hesitate to divulge their plans and estimates in open hearings. This was brought out by the officials of Boeing Aircraft Co., Seattle, Wash., who requested and were granted the privilege of taking Senator O'Mahoney to their plant and discussing some of their postwar problems at the plant site.

That individual companies are giving serious thought to postwar readjustment problems on the Pacific Coast is further illustrated by the accompanying table, prepared by Mr. Bernard E. Etcherverry, market analyst, Kaiser Co., Inc., iron and steel division.

The table in question is an estimate of postwar steel consumption on the Pacific Coast and Pacific Coast steel mill capacity. The column headed "Normal" is the estimated most probable consumption of steel on the Pacific Coast after the war.

These extremely favorable estimates take into account such possibilities as (1) postwar net exports of steel from the United States largely in excess of prewar net exports and (2) circumstances favorable to development of new industries on the Pacific Coast and rapid expansion of industries that already have small beginnings on the Pacific Coast.

Estimates in the table suggest that postwar steel mill capacity on the Pacific Coast will not be in excess of probable Pacific Coast consumption of steel after the war. This conclusion does not necessarily imply that Pacific Coast steel capacity will be fully used after the war.

Full utilization of Pacific Coast steel capacity will involve such factors as relative f.o.b. costs of production in eastern and western production centers, pricing policies of the large steel producing companies, freight rate differentials, etc.

Copper Deposit

A large deposit of copper has been discovered in the Blackbird district of Idaho by the U. S. Bureau of Mines, in which 2 per cent copper is mixed with cobalt, according to McHenry Mosier, chief of the copper division of the bureau.

Store Surplus Planes In Surplus Plants

Aircraft factories built by the government for the war emergency and which are not needed for airplane production after victory should be taken out of production at the close of the war and used as government warehouses for the storage of large numbers of left-over war planes, according to T. Claude Ryan of Ryan Aeronautical Company.

"It should be remembered that these factories were built primarily as weapons of war," he said. "Their cost is justified as a part of the cost of winning the war. Yet these plants do not have to be entirely written off. They would be of value as reserve facilities ready on short notice in case of any future threat of war. They would have great value as a discouraging element to any potential future enemy ambitions—as 'fire extinguishers' or 'peace insurance,' if you will.

"These plants, properly cared for, should remain in a serviceable condition for twenty to fifty years, depending on their type of construction. They are, in many cases, adjacent to the plants owned by the established aircraft manufacturers.

"It would seem wise for the government to make provision whereby portions of these war-built plants could be taken over from the government periodically as required by the aircraft manufacturers. They might either purchase or lease such portions of them as their business growth justified. It requires no optimism to expect that the growth of the industry over a period of years would enable it to absorb much and possibly all of this manufacturing space.

"The storage of the tremendous number of surplus war-built airplanes would have a parallel advantage to our country for a period of years. This period will be somewhat less, however, due to the fact that development in design will render current planes obsolete in four to ten years at the outside. However, even if partially obsolete, they would prove tremendously valuable in an emergency due to the large numbers immediately available.

"The other advantage of this policy would be to avoid the destructive and virtually fatal effect on the American aircraft industry of 'dumping' these airplanes on the market, either domestic or foreign."

Copper Overproduced, Other Metals Also

The government now has more copper than it can use, and the War Production Board has had to establish a sales department in Washington to help dispose of it, Harry O. King, head of the copper division of the WPB, told a meeting of the Arizona Small Mine Operators Association on November 11.

The United States right now is overproducing copper and virtually all other metals, King said. He explained that we are currently producing more than 10 times as much copper as Japan and four times as much as we did during prewar days.

In his opinion, three open pit mines now in operation can produce all the metal needed for peacetime production.

• CARBOLOY TOOL MAKING—A section of the machine shop at the aluminum rolling mill of Aluminum Corporation of America near Spokane is devoted to this work. Here is seen one of the women employees engaged in operating the rotary surface grinder.

• First car of scrap loaded by citizens responding to call from Tacoma's Salvage Committee. Note gosh-awful variety of junk to be sorted.

SCRAP—Tacoma Gets It Moved Out

Patriotism Ends at the Junk Pile with Most Cities, But Volunteer Groups Here Do the Necessary Sorting That Makes the Scrap Usable

THOUSANDS of communities patriotically joined in the national scrap metal collection a year ago, but most of them still have their accumulations of war junk still on hand, untouched—an eyesore and a headache.

Not so with Tacoma, Washington. Its scrap has been *moving* to war. With scarcely an interruption since last January, the Tacoma Salvage Committee has been applying volunteer work parties to its "Scrap Iron Acres" and sending the stuff to the steel mills and the foundries.

In fact, such an amazing and practical record has been established—an unique record so far as is known—that the Tacoma Advertising and Sales Club has joined hands with the Salvage Committee and issued a national challenge—itself unique—with the hope of passing on the practical experience of Tacoma and thereby stimulating the flow from thousands of Victory stock piles into active war uses.

The challenge is a highly interesting document in the form of a 28-page brochure with flexible plastic binding illustrated with well chosen and well executed cartoons and printed in two colors. It has now gone into the mails with an individually typed, personal letter from Mayor Harry P. Cain of Tacoma to the mayors of 287 cities in the United States with populations of 25,000 or more. In addition, copies have been sent to each daily newspaper in these same cities, to salvage chairmen and to advertising clubs.

Interest has been heightened by the fact that the Tacoma mayor personally bets his oldest pair of pants with each of the other mayors—against similar collateral—that Tacoma has made the better record.

Page by page, with skilled advertising technique, the brochure unfolds the problem which Tacoma's Salvage Committee faced when last fall it collected and deposited on a ten-acre field on a single Sunday an estimated 3,000 tons of mixed scrap—largely from Tacoma households. It was the usual collection of fence wire, leaky pots and pans, rusted out garbage cans, worn-out hot water boilers, obsolete lighting fixtures, car fenders, broken-down jalopies, and what have you.

The first feeling, morning after the collection, was one of great satisfaction for a successful drive and a job *done*. Then in ensuing weeks came the realization that the job was only started, that all this great mass of stuff was of no earthly use to the nation's steel mills and foundries unless it was sorted into usable classifications, prepared as to size, loaded and shipped. As in all communities, people who had contributed scrap to the collection began asking questions, embarrassing ones, about when the scrap was going to *move*. They complained of the eyesore. They felt that they had been bamboozled—again.

To move that scrap to war was definitely a problem of manpower and facilities. It was obvious that no manpower was available on the usual paid basis. Nor did the steel mills and foundries and junk yards have the space and facilities to handle this terrible mixture even if they could recruit the manpower—which they couldn't.

After probing the problem for several weeks the Tacoma Salvage Committee, under the able direction of its chairman, Sam I. Powell, an ice cream manufacturer, decided to make a try at sorting and moving

its scrap with voluntary labor. The committee had no idea where or how to start, but it enlisted the interest of the railway employees, largely because they were handy and had some knowledge of metal, and on January 17 made their first try. Mayor Cain himself was on hand that first day, and in fact was a steady recruit for several weeks.

Little more was learned on that first day other than that a terrific job lay ahead. However, the rude outlines of a formula did develop and in succeeding weeks, under the guidance and personal effort of the chairman of the scrap sorting division of the committee, Joe Dightman, a sheet metal worker, different fraternal, civic and labor union organizations were successfully solicited to sponsor respective Sundays and recruit manpower.

Now after about ten months, the committee has sorted, prepared and shipped, for actual conversion into war-needed metal, the following: 1,125,000 lbs. of steel; 3,633 lbs. of copper, brass, and bronze; 1,557 lbs. of aluminum; 2,596 lbs. of lead, zinc, and pewter; 25,047 lbs. of rubber; and some miscellaneous items.

Also it has become pleasantly aware that through classification and preparation it has been able to realize a higher financial return for its scrap. To date it has sold nearly $10,000 worth of stuff, donated $3,500 to the Tacoma War Council; maintained an office and secretary; employed an experienced, elderly junk man; bought supplies such as gas and oxygen for cutting torches, and has a neat reserve for emergencies.

Technique at "Scrap Iron Acres" has steadily improved. Sorting scrap is definitely a laborious job, and somewhat dirty, but at the same time fascinating because one never knows what ancient and interesting relic one will next turn up. At the same time, there are so many opportunities for service that the committee has successfully utilized old and young, strong and feeble, men and women and even boys of seven and up.

• The Tacoma Advertising & Sales Club mailed out 1750 copies of the "Challenge"; 287 of them with a personal letter from Mayor Cain to other mayors. Ad Club members conceived the idea and carried through all details down to the actual mailing. Shown here (l. to r.) are Lloyd Thorpe, v.p. of the club, Charles Devlin, pres.; and Mrs. Cain (whose husband is risking 287 pairs of pants on Tacoma's bet of its prowess).

Some few have come back Sunday after Sunday, for the pure fun of it, and from this group the committee has organized its supervisory force—extremely important when it is realized that an entirely new, green crew must be broken in and organized into an efficient working force every Sunday morning.

Each Sunday the committee arranges to have on hand from one to six cutting torches for breaking up heavy pieces, automobile chassis, etc. It also arranges for the loan of one or more heavy duty dump trucks and occasionally secures the use of derrick or wrecker trucks. After several weeks of demonstration a steel company offered the loan of a small power shears for reducing auto rims, bedsteads, etc.

When the carpenters union turned out, they built a ramp so that loading the gondola cars could be facilitated. The pile drivers' union borrowed and rigged a pile driver, and took on as their special function the smashing of an estimated 1,000 old hot water boilers. Negotiations are now under way for a steam roller or "Cat" —or even an Army tank—to flatten out bulky light sheet such as auto fenders.

The committee has found a "natural" morale builder in setting, as a definite objective for each Sunday, the loading of a car. In one or two instances the crew which responded was much smaller than anticipated and on such occasions there has been a feverish demonstration of hustle to get the car loaded. Most surprising, although not a man gets a cent for his day's effort, and although the usual methods of supervision that are applied to paid labor are not applicable, the energy demonstrated by the volunteers compares in every way with that shown by men on paid jobs.

The Challenge was conceived, styled and written by Lloyd Thorpe. He is publicity chairman of the Tacoma Salvage Committee, yard boss at "Scrap Iron Acres" and also vice-president of the Tacoma Advertising and Sales Club. In business life he is assistant public relations director of the Weyerhaeuser Timber Co.

It was prepared and distributed as a war project by the Tacoma Advertising and Sales Club, whose members donated their time. The challenge is entirely a Tacoma project and was financed by several cooperative and patriotic Tacoma firms and organizations.

Alcohol From Potatoes

Production of industrial alcohol from cull potatoes by Galsworthy, Inc., at Idaho Falls, Idaho, is to begin some time in December. They have spent $80,000 in remodeling their plant, which was formerly operated by the University of Idaho as an experiment station for alcohol from potatoes.

Mining Costs Much Higher

Greatly increased mining costs, according to a speaker at a recent meeting of the Denver Mining Club, have been accompanied by a 20 per cent decrease in efficiency, and absenteeism is much less on work financed by private capital, where pay is semi-monthly, than on government sponsored jobs where the weekly payroll is mandatory.

Accounting costs for plants under direct charge of government agencies were declared to be from five to six times more than the cost of accepted accounting procedure of private industry. An example cited was on projects costing between $200,000 and $1,000,000, the cost of field accounting based on private practice runs approximately ½ of 1 per cent of the total cost of the job, whereas it varies between 2½ and 3 per cent of total job cost when complying with government regulations.

Overall cost of a flotation plant at this time is at least 50 per cent more than in 1939. Some unit cost comparisons given were as follows:

	1939	1942
Labor, per hour	$0.65	$0.870
Overhead, hour	-----	0.094
Insurance, hour	0.06	0.106
Total, hour	$0.71	$1.070

	1939	1942
Cost conc., yard	$22-$24	$33-$35
Installation mach., ton	$40-$45	$70-$80

Utah Ordnance Plant Closing

Shutting down of the Utah ordnance plant in Salt Lake City by December 31 will release about 8,000 employees who can be absorbed in other plants and in the mines, and will reclassify Utah as a No. 2 or No. 3 labor area instead of a No. 1 critical area. The steel industry is expected to be able to use 5,000 men, and Hill Field upwards of 1,000. Remington Arms Company are the contractor-operators of the ordnance plant.

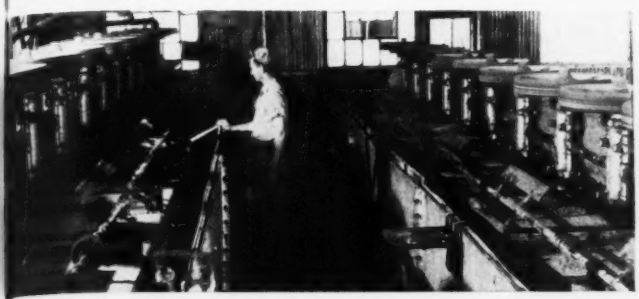
Reasons for the shutdown were given by Major General L. H. Campbell, chief of ordnance, as including the following:

Unexpectedly large production; lessening danger of the loss of supplies through submarine sinkings; extraordinary effectiveness of the .50-caliber incendiary, which has resulted in a large saving of ammunition; a smaller demand from fighting fronts than was originally anticipated.

Office Workers

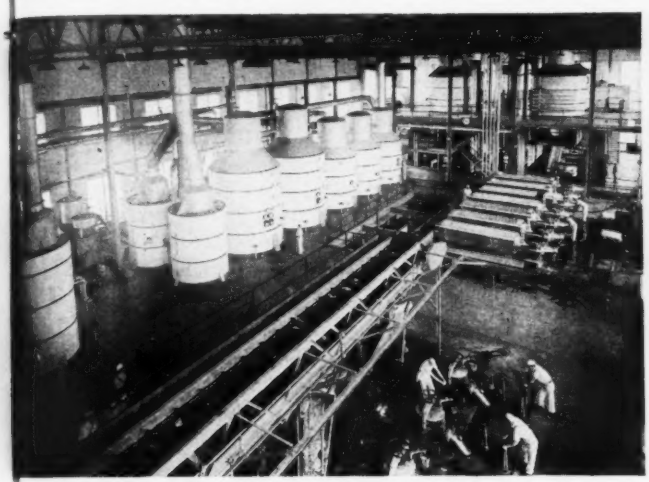
The Northwest RWLB has raised wage rates for office workers employed by the Longview Company, Longview, Washington. Typists and stenographers will get $100-$108. Senior Stenographers, $110 to $117. Junior secretaries $110 to $132. Senior secretaries $132 to $146. Senior bookkeepers $197.50.

WESTERN INDUSTRY IN PICTURES



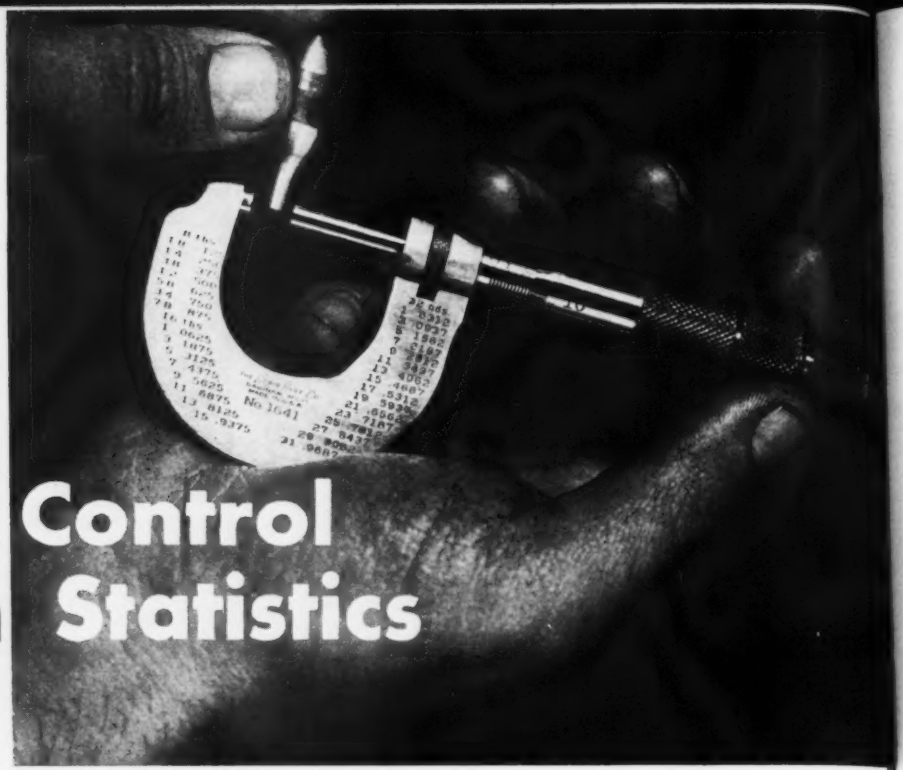
• Battery of flotation cells which float the tails, NaCl away from the concentrate, KCl, in refinery, Potash Co. of America, Carlsbad, N. M.

• Interior of main wing of plant, Amalgamated Sugar Co., Nyssa, Ore.



• Craftsmen installing a bearing lined with a laminated phenoli plastic in the stern tube of a C-2 cargo ship at Moore Dry Doc Company yard, Oakland, California. Great accuracy is required i determining the fit and subsequent installation of stern tube and ster bearing, which support the line shaft. The ships are driven by propeller turned at end of section line shaft and tail shaft having total length of one hundred eighty-one feet and a weight of 144,000 lb

• Loading Douglas Fir logs on a giant truck on a timber company operation in the Pacific Northwest.



Quality Control Through Statistics

By WILLIAM B. RICE*
Director, Department of Statistics and Reports,
Plomb Tool Company, Los Angeles

TO SHOW the need for "Quality Control Through Statistics," let me begin by telling you a true story about specifications that happened in a Los Angeles plant.

Once upon a time there was a prime contractor who had a sub-contractor. Mr. Prime gave a contract to Mr. Sub to produce a wheel with a hub specified as .500±.001.

In the first place, what did Mr. Prime mean by this specification? Did he mean to insist that every single one of the wheels must be within the limits .499 to .501?

If so, it was an unreasonable requirement, because, as we all know, no two pieces produced by a machine are exactly alike, and out of the million wheels some were bound to be too large or too small. Perhaps Mr. Prime meant that his inspectors must not catch any bad ones, which would give Mr. Sub an out if he could discover how much Mr. Prime was inspecting his product.

Anyway, this specification was accepted by both parties, each presumably making his own interpretation of it. But then Mr. Sub ran into trouble. His estimating department had figured on using a new automatic screw machine and an expert set-up man; but he had to put his best machine on another job, and had to use a 15-year-old automatic which in normal times he had kept as a stand-by. Furthermore, his best operator left to take a job with his competitor across the street.

So Mr. Sub's shop superintendent and chief inspector agreed that they would try to hold a tolerance of ±.002. The inspector, being a generous man, would even let an occasional one go through which was .003 too small, figuring on his own initiative that a hub a trifle small would assemble all right, but one too large might not. The result was a shop specification of +.002, —.003.

At this point Mr. Sub's statistician (if he had one) stepped into the picture. He said, "Let's find out what is actually coming off the machine."

He took some samples, made some calculations, and came back with the verdict, ±.003. By which he meant something specific, namely this: that *if* no unexpected difficulties arose, if the green operator set up the job right, if the steel was good, if the tools stood up—the automatic would, in its present condition, produce at least 99 pieces out of 100 within .500±.003—an "operating" specification.

In the meantime, unknown to anybody, the gauge which Mr. Sub's inspector was using had worn down to +.003, —.002; but since rule-of-thumb spot inspection was used, that didn't bother anybody very much. Lots of the over- and under-sized wheels got through anyway.

While this was going on, Mr. Prime had been sending back about one lot in every three, often with caustic remarks about quality and such matters. By this time Mr. Sub was so confused that he called on Mr. Prime one day, admitted he wasn't holding to specifications all the time, and explained why. Mr. Prime was very sympathetic, but a contract was a contract and had to be held to strictly, etc., etc.

In the course of the discussion, however, it developed that there had never been any trouble assembling the wheels. Again the statistician was called in, and in cooperation with Mr. Prime's engineering department made an investigation, uncovering the fact that ±.004 on the wheel hub was perfectly satisfactory in actual practice.!

Mr. Prime nevertheless stated that his hands were tied because the government specified ±.001 on its blueprints, though the government had never rejected a working assembly on that account. So all parties were right back where they started from—±.001.

Let's review the various tolerances which were found in this sad case:

Blueprints	.500±.001
Shop	±.002, —.003
Operating	±.003
Gauge	±.003, —.002
Usable	±.004
Consumer (Govt.)	±.001

In this quagmire of shifting standards there are only two spots of solid ground. To find the first one it is necessary to answer the question, "What does the process—the operation—the machine and the man—actually produce?"

Certainly Mr. Sub should not bid on a contract until he can answer that question, because there lies the very essence of his cost estimating. His costs will, in general, mount in geometric ratio as his tolerances get narrower.

If it had happened that the specification

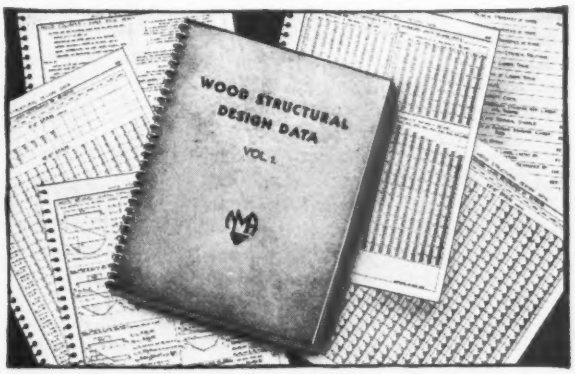
(Continued on Page 34)

*Paper read at Third Annual Management Conference, University of Southern California, May 29, 1943.

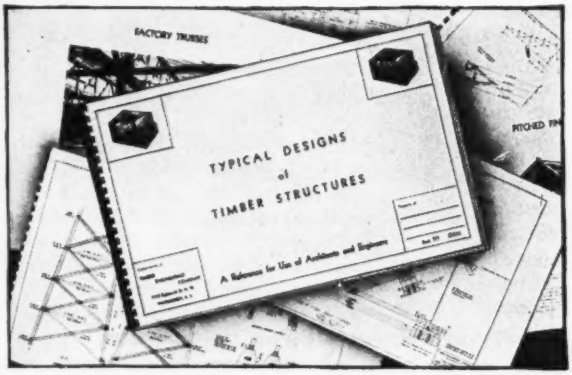
SERVICES TECO HAS FOR YOU

WHEN YOU BUILD WITH WOOD

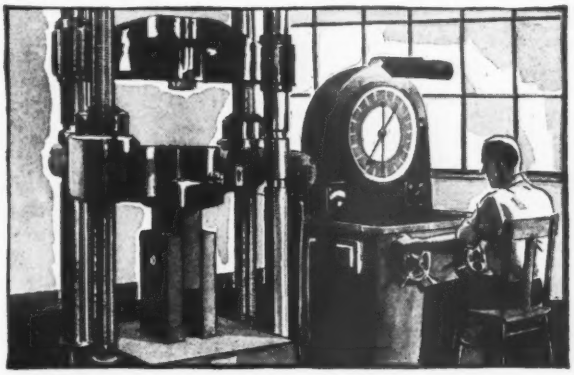
CONSULTING SERVICE. Teco maintains a staff of engineers to consult with architects and engineers on their design problems. Teco Connector distributors and fabricators in all parts of the country also render helpful services.



DESIGN DATA SERVICE. Teco has available for architects and engineers complete data on all phases of timber design, including tables and charts on timber beams, columns, floors, connector loads, bolt loads, stresses, etc.



TYPICAL DESIGN SERVICE. "Typical Designs of Timber Structures"—a 100-page book—is available to architects and engineers free upon request. Copies of several hundred other designs of typical Teco Timber Structures are also available on request.



RESEARCH SERVICE. Teco conducts a continuous research program through laboratories as well as sponsoring research at outstanding engineering colleges to increase the design knowledge of timber designers.

Wood is often referred to as the *rediscovered* material, due to its development by science for plastics, laminations and heavy construction.

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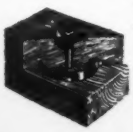
The Teco timber system serves our war effort . . it will *serve you* in peace times too. TIMBER ENGINEERING COMPANY OF CALIFORNIA, San Francisco, and TIMBER ENGINEERING COMPANY —Washington—Chicago— Minneapolis—Portland.



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QUALITY CONTROL *(From Pg. 32)*

of ±.001 had been really critical, he would have had only one recourse: beg, borrow, or steal a new automatic screw machine, and hire back his old operator at a fancy price. The only hitch would be that WPB would more than likely deny him priorities for a new machine and WLB would refuse to let him hire back his old operator!

The other spot of solid ground is the "usable" tolerance of ±.004. Mr. Prime should have had that in mind when he negotiated with Uncle Sam in the first place. Cost would have been lower, production faster, and everybody happier if the question, "What will work satisfactorily?" had been investigated with an engineering-statistical study *before* the contract was signed.

And it's at these two points—actual production and actual use—that Quality Control really proves its worth. It gives the answers, economically, accurately, practically.

When I say that quality control is not difficult, that any intelligent foreman can use it once the procedure has been set up, I am making a statement abundantly proved over a long period of years by the Bell Telephone laboratories, General Electric Company, the U. S. Army Ordnance Department, and many other organizations, large and small.

Let me illustrate with another true story. One of the aircraft companies here in Los Angeles has a sub-contractor who is making a small screw for a certain sub-assembly. This particular Mr. Sub knew that he was having a lot of trouble, but he felt very strongly that Mr. Prime was unduly harsh in rejecting more than 50 per cent of his output.

Relations between the two were going from bad to worse when one of Mr. Prime's men who had studied statistical methods of Quality Control took a hand in the matter. He talked it over with Mr. Sub, and they agreed to give it a trial.

The first step was to decide exactly what gauge measurements were acceptable. Both parties came to the conclusion that if not more than three threads projected from the thread gauge, the screw would pass. Next, Mr. Sub put an inspector on each machine until the trouble was found and corrected. Written inspection records were kept and put on Quality Control Charts in order to find out exactly what was happening in the manufacturing process.

In order to make this chart, Mr. Sub measured some small samples—four or five screws in each sample—and averaged them. Each point on the chart is one of these averages. The solid central line is the average of all the points. The limit lines are calculated by a simple formula which requires only grade-school arithmetic.

All the points on the chart should fall inside the upper and lower dotted lines. If they don't, there is trouble somewhere. The fact that so many points fall outside showed something really was seriously wrong with the process.

Mr. Sub's next step was to put his engineering and methods departments to work on each trouble spot as soon as it reared its head. Their investigations eliminated the problems one by one, until finally the charts looked like the second one reproduced here.

Here all the variations are normal; that is, they are caused by a thousand and one small factors, so intertwined that to separate any one of them out would cost more than it is worth. The dotted lines, therefore, can be considered as a scientific and practical answer to the question: "When is trouble worth investigating?"

Any point outside the dotted lines (as in the first chart) says to the factory executive, "I'm a symptom of sickness. There's something badly wrong with me. I need to be diagnosed and cured."

So when Mr. Sub had finally gotten rid of all the symptoms, he could be confident that no major trouble was left, that his process was in good health, that all the variations on the chart were normal. These ups and downs inside the dotted limits were to be expected, because they were caused only by natural variations in raw material, machinery, workmanship, and so forth.

At this point, with his process "in control," Mr. Sub was able to reduce his inspection to occasional sampling. He could feel confident that inspecting a few pieces every hour or so would be sufficient for him to keep control of his process. His rejections dropped from 50 per cent to 2 or 3 per cent.

In the meantime, Mr. Prime had been keeping control charts at his end. As soon as he saw that Mr. Sub's charts were in control, Mr. Prime reduced his inspection also to occasional sampling, because he, too, could be confident of Mr. Sub's quality level.

Thereafter, with every shipment Mr. Sub sent along his inspection records and control charts for Mr. Prime to examine. Mr. Prime compared these charts with his own and could then be positive that both parties saw eye to eye on the matter of quality standards.

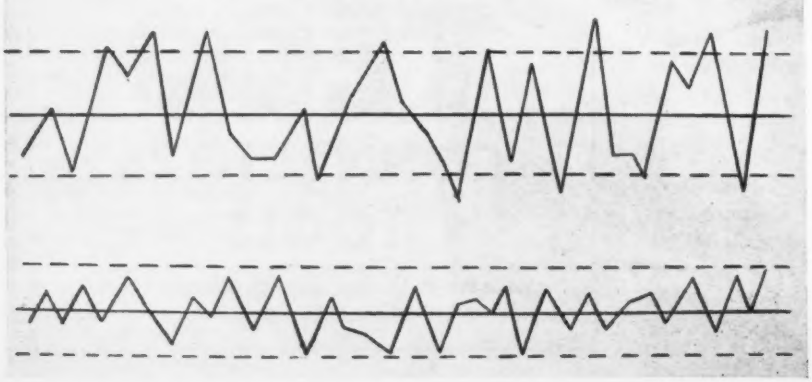
But suddenly one day Mr. Prime called up Mr. Sub. "Our charts don't agree," he announced. Mr. Sub promptly checked his records but could find nothing wrong. Mr. Prime did the same. By a process of elimination both came to the conclusion that it must be the gauges. Sure enough, it was. Mr. Sub's gauge had gone bad. When it was replaced, the trouble vanished.

In this true story can be found most of the major contributions of statistical quality control to manufacturing efficiency. Specifications we have already discussed in some detail. But the contributions, first, to engineering, and second, to inspection, are equally if not more important.

(Concluded in January issue)

QUALITY CONTROL CHARTS

Each point on the upper chart is an average of the measure of several screws in a sample. Solid central line is the average of all points. Lower chart shows the result of eliminating some of the bad spots in production.



Scrap Shipments

Iron and steel scrap shipments from the three coast states, Arizona, Nevada and Idaho for July and August, totalled nearly 330,000 tons, nearly 35 per cent of their quota for the last six months of 1943. In five of the eight months ending in August, mills have consumed more purchased scrap than received, indicating that they have pretty well used up their supply of scrap on hand.

Vancouver Forging Plant

Establishment of a large forging plant in Vancouver, B.C., as part of a war industry development overshadowing all previous projects, is in the offing. It would fit into a program expected to get under way early next year, when plants which slowed down production recently because of changing war needs, will probably step up their tempo again with new contracts.

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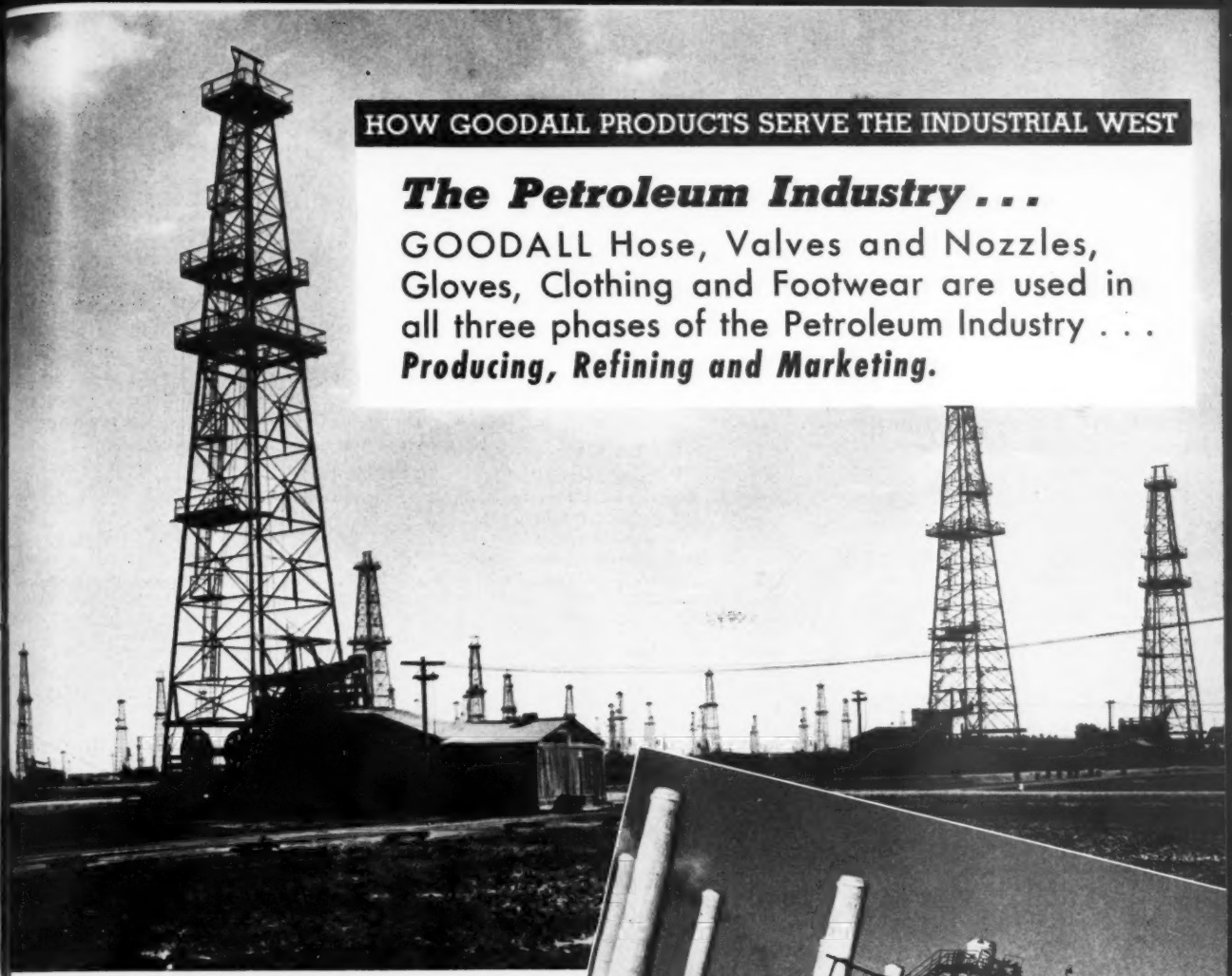

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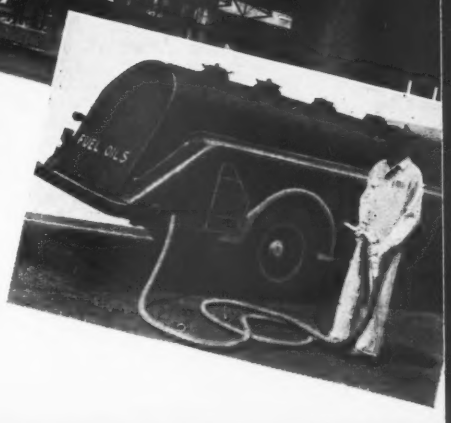

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THE OUTLOOK—News and Statistics

SIGNS of a leveling off in war production are appearing, and industry is no longer running hog-wild in purchasing of equipment and materials. For example, one coast airframe manufacturer is in the market to dispose of nearly $10,000,000 worth of machine tools and materials of various kinds, with others reported to be preparing to follow suit.

Surplus steel inventories apparently have greatly increased. Actually, however, they have merely come to light because the Steel Recovery Corporation of Pittsburgh ceased on November 1 to function as a selling agency and its inventories were reallocated to the respective WPB regions where the surplus steel is located. It had duplicated functions of the redistribution division of WPB, with the result that no one knew just how much steel was on hand, and also there was so much delay in routing orders through Pittsburgh.

Now all negotiations for purchase of surplus steel on the coast may be made through the regional WPB offices in San Francisco, Los Angeles, Portland, Seattle, Boise and other intermountain offices. This means quick contacts. If supplies are not available in the West, the WPB checks its offices elsewhere in the country for the benefit of industry.

As a result of the change, there is prospect of the rolling cycle for steel trending back toward the normal time of six weeks, instead of the six months caused by overbuying and lack of information.

EMPLOYMENT

Estimated Number of Employees in Non-Agricultural Establishments

ALL INDUSTRY DIVISIONS

(In Thousands)

Source: U. S. Bureau of Labor Statistics

	—Montana—		——Idaho——		—Wyoming—		—Colorado—		—New Mex.—		—Arizona—		——Utah——		—Nevada—		Total Mount'n	
	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943
January	113	110	88.9	105.0	54.0	57.0	249	288	73.6	80.3	99.5	111.7	131	182	36.0	43.8	845	978
February	112	110	89.4	106.3	53.5	57.8	251	278	74.9	79.5	99.4	112.6	131	174	35.9	45.0	847	965
March	112	110	90.2	101.9	54.2	58.6	256	281	81.3	78.6	100.3	112.2	139	173	37.1	48.3	870	964
April	113	110	92.5	104.3	55.2	59.0	260	282	87.0	78.9	111.1	114.1	146	171	37.7	47.1	903	966
May	116	111	95.5	106.6	58.1	60.5	269	280	84.1	78.3	110.3	118.9	155	173	39.0	47.4	927	976
June	114	112	94.1	101.3	59.3	61.4	276	285	79.2	79.1	110.2	116.2	164	173	37.4	47.3	934	974
July	114	112	97.0	100.4	61.2	61.0	300	284	81.5	81.8	106.1	112.4	165	180	37.8	44.8	963	976
August	119	113	118.7	98.4	63.7	61.9	308	287	87.8	83.2	113.1	108.7	180	178	39.5	41.9	1,030	972
MANUFACTURING																		
January	15.0	15.1	11.6	11.8	4.0	3.7	46.7	66.5	4.8	4.4	8.4	12.7	20.7	30.8	1.5	1.7	113	147
February	14.7	14.5	11.8	11.9	4.0	3.7	49.5	64.2	4.9	4.5	8.7	12.8	20.9	30.6	1.5	2.0	116	144
March	14.6	14.3	11.8	11.8	3.9	3.7	52.1	63.4	5.0	4.5	9.2	12.6	23.8	30.5	1.5	4.2	122	145
April	14.7	14.2	12.3	12.2	4.0	3.7	54.7	63.9	4.7	4.4	10.2	12.5	27.3	31.2	1.6	4.5	130	147
May	14.9	14.2	13.5	13.4	4.2	3.7	56.1	64.0	4.6	4.2	10.1	13.8	29.9	30.8	1.5	4.9	135	149
June	15.1	14.4	14.7	14.0	4.3	3.8	58.7	65.0	4.4	4.5	10.3	13.1	32.2	33.7	1.5	5.5	141	154
July	15.3	14.5	16.5	15.2	4.4	3.9	61.6	67.0	4.3	4.7	10.2	13.5	38.6	40.4	1.6	5.2	154	164
August	16.1	15.2	...	14.2	4.8	3.9	62.3	67.0	4.6	4.6	10.4	13.4	37.2	36.9	1.6	5.0	153	160

ALL INDUSTRY DIVISIONS

	—Washington—		—Oregon—		—California—		TOTAL PACIFIC	
	1942	1943	1942	1943	1942	1943	1942	1943
January	522	638	292	339	2,232	2,611	3,046	3,588
February	535	634	301	341	2,229	2,642	3,065	3,617
March	544	646	325	348	2,248	2,663	3,117	3,657
April	565	648	350	349	2,298	2,685	3,213	3,682
May	583	643	339	351	2,327	2,694	3,249	3,688
June	602	655	356	361	2,367	2,726	3,325	3,742
July	627	673	387	362	2,485	2,734	3,499	3,769
August	638	665	363	361	2,558	2,776	3,559	3,802
MANUFACTURING								
January	182	259	110	145	661	1,002	953	1,406
February	188	255	114	145	683	1,022	985	1,422
March	192	257	121.6	147	696	1,036	1,011	1,440
April	197	256	129.6	147.2	736	1,052	1,063	1,455
May	205	255	131	148	758	1,050	1,094	1,453
June	219	263	139.8	153.7	789	1,061	1,148	1,478
July	235	274	148.4	157.3	860	1,080	1,080	1,511
August	251	271	150.4	157.9	928	1,142	1,329	1,571

Western Industrial Activity Upward

Continuing rise in industrial output in the West is clearly shown by the accompanying employment tables. Manufacturing employment in the three coast states in August 1943 was 1,571,000 or 242,000 above August 1942.

Pacific Coast shipyards which have been building warships will now be largely devoted to repair work, because of the stepping up of war in the Pacific.

It is expected that some additional production of civilian goods will be permitted before long, but the coast offices of Smaller War Plants Corporation find very few manufacturers interested in taking civilian contracts.

WAR PRODUCTION CONTRACTS

(In Thousands of Dollars)

Source: War Production Board Statistical Division

	MONTANA	—IDAHO—		WYOM.	——COLORADO——			N. MEX.	——ARIZONA——		UTAH	—NEVADA—		TOTAL		
	All Other	Ships	All Other	All Other	Aircraft	Ships	All Other	All Other	Aircraft	All Other	All Other	Ships	All Other	Aircraft	Ships	All Other
March	199	...	3,174	19	107	....	56,396	...	4,980	....	5,425	. .	1,622	2,448,393	714,851	82,630
April	1,754	...	....	3,894	...	....	7,284	...	...	....	96	...	643	78,733	53,241	61,055
May	—158	100	—81	782	...	....	3,855	107	....	....	824	156	197	80,541	104,523	51,099
June	191	85	51	. ..	...	1,338	63	185	....	....	1,338	...	1,737	241,926	50,435	51,550
July	852	...	1,319	5,689	...	56	1,522	142	10,000	1,399	1,131	...	1,146	860,744	42,609	101,308
August	...	...	926	693	...	....	....	263	....	....	586	...	1,538	630,192	382,430	287,725

	——WASHINGTON——			——OREGON——			——CALIFORNIA——		
	Aircraft	Ships	All Other	Aircraft	Ships	All Other	Aircraft	Ships	All Other
March	188,548	310,158	1,905	...	97,697	332	2,254,758	306,996	11,893
April	1,427	9,367	28,877	332	9,962	9,368	76,974	33,912	13,139
May	339	2,853	5,992	...	10,942	2,214	80,202	90,472	32,756
June	5,992	8,635	4,189	...	25,193	2,303	235,934	15,184	41,493
July	616	—11,339	24,859	—688	40,816	5,285	850,816	13,076	57,964
August	5,000	136,822	9,198	. .	179,578	31,624	625,192	66,030	242,897

This war production contracts table merely shows contract awards. Consequently the variation from month to month does not indicate fluctuation of activity, and the employment statistics above are a more definite guide to the trend of production.

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West Needs to Back Up Its Congressmen

Efforts to Encourage Decentralization of Industry Will Fizzle Without Real Support

By ARNOLD KRUCKMAN

One of the best-informed writers at the Nation's Capital, Arnold Kruckman, presents each month authoritative comments on political developments and their practical application to industry of the West. Any reader who wishes additional information may write to him directly, using business letterhead, at 1120 Vermont Avenue, N.W., Washington, D.C. Inquiries will be answered free of charge. You also are invited to contact him personally in Washington. Copies of pending congressional bills may also be obtained free of charge.

TWO results thus far have stemmed from that congressional indignation meeting of the 100 Westerners and Southerners called by Senator McCarran. The Nevada Senator introduced S. 190 providing for the appointment of a Senatorial Committee of Seven to study the centralization of heavy industry and its effect upon interstate commerce with particular attention to the harm it does to other sections, and with especial attention to the establishment of new iron and steel plants, or expanding of existing plants, apparently in sections where the industry is relatively new or untried.

The bill directs the committee to recommend necessary legislation, and gives it full authority to take depositions under oath. The bill was quickly reported out of the Senate Interstate Commerce Committee with full approval, and was sent to the Senate Committee on Audit and Control for approval of the $10,000 appropriation involved.

It is a demonstration of the penny-wise and pound-foolish policies of Congress that this committee, which has helped to scatter billions upon billions upon direction from those who direct, pared this peanut appropriation of $10,000 to $5,000. The bill has not yet been sent to the floor for action, Senator McCarran having been absent the past month.

You may assume, however, that this petty paring, without the least regard to the tremendous significance of the purpose of the bill in relation to the West, is designed as a slap at McCarran, unloved by the Administration, and will not be unnoticed by the cartels in the East. Obviously $5,000 will scarcely pay the casual expenses of an investigation of such magnitude. It hobbles the whole plan.

If the people in the West do not make a resounding fuss about this, the whole investigation will simply fizzle to a series of nice conversations.

The other result apparently is not much more significant. The heavy artillery which boomed at the indignation meeting of the 100 Senators and Congressmen provided for a steering committee of seven Senators and seven Representatives to move to prevent the strangulation of industries in the West and South, after the war. Here is the joint committee as finally announced by McCarran before he disappeared into the West:

For the Senate, Senator Pat McCarran, chairman; Senator John H. Bankhead, secundo, Democrat, Alabama, a lawyer and one of the Bankhead dynasty of Alabama, to which Tallulah belongs. Also Senator Guy M. Gillette, Democrat, Iowa, lawyer and farmer, and not much loved by FDR; Senator Abe Murdock, Democrat, Utah, lawyer and veteran office holder; Senator Gerald P. Nye, Republican, North Dakota, prickly publisher of numerous country newspapers; Senator Edward Vivian Robertson, Republican, Wyoming, born in Wales, sheepman and livestockman and general store operator; Senator John Thomas, Republican, Idaho, livestockman, successor to Senator Borah.

The House members are: Rep. John M. Coffee, Democrat, Washington, former secretary to former Senator C. C. Dill (often seen around the District of Columbia); Rep. Wright Patman, Democrat, Texas, whose name is identified with trade practices, and who is head of a current Small Business Committee which has issued many statements. Patman has one of the most detailed autobiographical statements in the Congressional Directory. There is also among the seven, Rep. Malcolm C. Tarver, Democrat, Georgia, apparently a fundamentalist, because he used to have the reputation of looking upon irrigation and reclamation as an offense to God because these pernicious Western ideas by-passed dependence on rain; and Rep. Cecil R. King, Democrat, Southern California, who lists himself as a business man; also, Rep. Thomas D. Winter, Republican, Kansas, lawyer, who was in the air service during the first World War, and then went into the service of the taxpayers rising steadily from the post of court reporter to his present job; finally, Rep. Francis Case, Republican, South Dakota, a rancher and newspaper publisher.

The friends of these gentlemen undoubtedly regard them as estimable, but as a steering committee the group is rather disappointing to the Western delegation. There are not many names among them outstandingly identified with active efforts for the West Slope as a whole.

As a matter of curious fact, few of the members of Congress from the West Slope are aware this steering committee exists, despite announcement of its appointment in the Congressional Record. The committee has held no meetings, in the absence of Senator McCarran the past month, and apparently will not have a meeting until he returns some time in December. Nor is it clear yet just what the committee will steer, except the fate of the bill S. 190.

There seems to be considerable uncrystallized sentiment hereabouts that industry must be decentralized after the war. The President himself is reported to have forcefully told Rep. Patman every section of the country must be made "economically self-sufficient."

Commerce Secretary Jesse Jones told Patman's Small Business Committee new private industries everywhere should be saved, and industry should be given every opportunity to buy the facilities owned by government after the war. Mr. Jones thinks government should not embark upon any form of production trespassing upon private industry, and there should be decentralization of the industries concerned with steel in the 32 States which have iron ore.

He mentioned particularly the $19,000,000 steel plant owned by the government at Provo, Utah; and the Kaiser plant, built by government. He revealed that the government has invested approximately $1,000,000,000 in steel plants. It will be encouraging to learn that Mr. Jones feels local people should have first chance on easy terms to take over plants, and that small units should have every opportunity to get into the business.

We are told here there are approximately 150 corporations in this country producing steel. The prevailing thought is that most of our postwar business with Europe will be based on barter, and that even

(Continued on Page 40)

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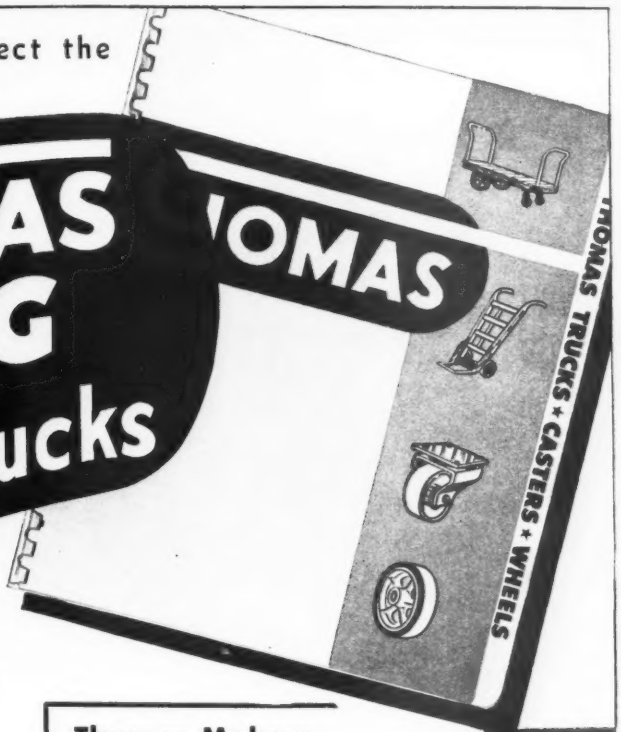

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KRUCKMAN *(Cont'd from Pg. 38)*

on a barter basis Europe will not be a very brilliant customer for some time.

The Pacific areas are regarded as the great potential consumers of the immediate future. Apparently the cartels east of the Mississippi expect to ship their products by way of the Ohio and the Mississippi, via the Gulf of Mexico and the Panama Canal. It is this prospect that causes some of your friends in government to fear the West may be restricted to two major industries—shipbuilding and aircraft.

There have been rumors that Western groups plan to organize to convince the government and the people of the country that all normal industries should be encouraged to expand in the West, but it is feared the organization of this type of campaign may be restricted by limitation to specific and special interests.

Your friends here believe any educational effort of the kind should embrace all economic interests of the West Slope because the expansion of one inevitably must advantageously react upon the other. There seems little doubt the old type of solo plugging for special and specific interests would be fatal in the new circumstances ahead.

There is only a remote prospect that we will have a national labor draft by law. After Deputy Administrator Leo R. Werts and West Coast Regional Director Hopkins of WMC came back here and reported on the operation of the West Coast Manpower Plan, the Labor-Management Policy Committee, speaking for WMC, WPB, OES, WSA, and other agencies, came out for a formal statement definitely and unequivocally shelving the labor draft.

FDR did not participate in this declaration, but practically all the brass hats who speak his mind were involved. Congress is emphatically opposed to the draft because the country made its sentiments very clear when Congress was back home. Organized labor has always been against it.

The Army, on its own behalf as well as the Navy, is the only important element still insisting upon a labor draft. Werts, now back in San Francisco, made clear that you people out there apparently have been sold the idea that the plan is sound and that it works. We have a strong hunch that you were convinced because Werts is reasonable and knows how to adapt the details to regional needs.

Apparently the fear of more widespread contract cancellations prompted the more greedy industrialists to discover they could do the same job with less men. And local sentiment undoubtedly compelled suspected hoarders of labor to reduce their requisitions for men.

We hear your anticipated manpower needs may be cut by more than 30 per cent without interfering with contracts or production. This probably means West Coast shipbuilders and aircraft plants may be able to do their jobs easily with approximately 100,000 less workers. Labor ceilings, and enforcement of labor ceilings, defining how many persons an individual contractor may employ, are said to have been accepted without moans by the industries in all West Coast areas.

In every instance the ceilings were substantially lower than the schedules submitted as irreducible by the contractors. They tell us even complaints have ceased. Werts is said to have told the people here that the job has been boiled down to a bookkeeping operation, balancing needs against supply. The main task left is to make necessary technical adjustments while the plan is operating.

When Werts was here no need for major changes had been discovered. From the germ of the "locally needed" program the plan was developed into the West Coast program by Werts. It is his triumph, although neither he nor his associates will tell you so. The less credit you claim in government the easier it is to do your job. But that does not estop others from placing the credit where it is due.

It is significant that here they are trying to smother the term "West Coast Plan." They think it might raise hostility to adoption of the plan in other regions. But most of us think they cannot erase this identification any more than they could divorce the idea of gold or oranges from the name of California. People will logically feel if the plan works in the large and important region in the front yard of the Pacific, it will work elsewhere.

LOVE-6 ON LOVEGREN

They hazed Carl N. Lovegren, the California packer, in OPA the other day. Lovegren is the new head of OPA's canned fruit and vegetables division.

It is possible he may have permitted the word to get about that he would straighten out some of the mess the coast people have been fussing about. The trouble is almost invariably when you get inside the things they fuss about outside appear differently. Apparently Lovegren naturally reflected some such attitude in early conferences with his OPA colleagues.

Not long after the higher-ups sent him a memo. They asked him for a report on file so-and-so. It was urged upon him that this was a hot subject, and that the people in the West who had protested in sizzling and unvarnished terms, asking for relief, must have some answer.

Lovegren sent for the file. It was based upon a letter from the National Canners Association written by a businessman named Carl N. Lovegren. . . . If you wish to reach Lovegren here in Washington, D.C., his office is in room 5230, Federal Office Building No. 1, and his telephone is Republic 7500, Extension 72342.

"JEEPERS CREEPERS"
—San Francisco Call-Bulletin

The WMC purpose is to use the framework of the plan everywhere, as a substitute for the abandoned labor draft. It will shortly be applied to the Great Lakes region centering around Detroit; and in the Middle States region around Akron, Ohio, also in the Down East region centering around Hartford, Connecticut.

By next July WMC expects the plan to be working smoothly in all the 80 major critical labor areas, as well as in the hundreds of small centers in every part of the country.

Controlled hiring (sometimes called "referral") through USES, is the groundwork of the plan. Next in importance is establishment of plant priorities, determining which plant gets the first claim on specific types and quantities of workers. The last and most infrequent step is to withdraw civilian and war production from the area when it is necessary to bring the supply of manpower and the demand for manpower into balance.

Aluminum After All

On the surface it appears the Pacific Northwest will finally be permitted to use its vast kaolin clay beds to produce aluminum. WPB reversed itself after further consideration in the Aluminum and Magnesium Division and told Rep. Fred Norman of Washington and Rep. Homer D. Angell of Oregon that the Columbia Metals Corporation might go ahead so far as WPB is concerned if the manpower problem could be fixed up with the West Coast people and the WMC.

The WMC here and out there apparently said it would be all right if the War Urgency Committees of Washington and of Oregon approved. These committees have been meeting separately to discuss the project and are expected to meet jointly circa December first.

Rep. Norman, who has been the most vigorous protagonist of the plan here, is confident the joint meeting will produce

the necessary clearance out there. He thinks the next step will be the invitation to the Army Engineers and other government engineers to determine the site for the location of the plant. Rep. Norman naturally earnestly wishes that Longview, Washington, may be chosen. Rep. Angell has in mind a site near Salem, Oregon.

It is a pleasant variation from the usual experience here (where the members of Congress usually can see only the virtues of their local districts) to find that Norman is quite willing to concede that the primary purpose must be to make sure the plant comes to the Northwest, and that the site is secondary, inasmuch as the kaolin beds in several states will be utilized to bring prosperity to the entire region.

Normally it would be safe to assume it is all over now but the formalities. There is so much that is devious, however, and so much that is unexpected in the operation of affairs here under present circumstances that even Rep. Norman is not ready to call it an accomplished fact until the engineers have chosen the site and the contracts have been signed.

Whether or not Utah has a chance to secure approval for its proposed aluminum plant at Marysvale, near the alunite deposits, is apparently unknown to Sen. Abe Murdock. The cost of the Marysvale project was estimated by RFC at $775,000 as against $4,000,000 for the plant in the Northwest. In all candor it seems unlikely that the Utah enterprise will be approved.

Aircraft Parts

The appeal sent to Congress by the Aircraft Parts Manufacturers Association, like all other appeals pertaining to contract termination, has been filed with the House Military Affairs Committee, where it will undoubtedly repose peacefully until Congress debates and acts upon the bill introduced by Rep. May, HR 3022, to clear up the long-drawn hearings on the subject.

Aircraft Parts Manufacturers Association is only one of hundreds, possibly thousands, of organizations and corporations which have bombarded Congress with their ideas. A companion bill has been introduced by Rep. Vinson, HR 3519, to facilitate contract terminations with the Navy.

Many witnesses representing the aircraft industry came to the House Military Affairs Committee hearing and told highly dramatic stories about the terrible things that will happen to the industry at the end of the war if the proposed legislation does not provide immediate liquidation of obligations to prime contractors and subcontractors.

Lucien M. Shaw of Lockheed stressed it was life and death to the industry and that even now the prospects are "appalling." He testified the six Pacific Coast companies have 18,800 subcontractors and vendors, and that each of these in turn has subcontractors possibly totalling collectively as many as 200,000.

He vigorously opposed a review and audit of negotiated terminations as unworkable. Undersecretary of War insisted the capital of small business tied up in war production must be liquidated before industry can again start peacetime production.

It will be wise for the airplane industry to realize it might hurt its genuinely distressing prospects by overstressing the expected conditions. Congress is not much impressed by tragic stories unless they can be supported by irrefutable facts. Apparently it has not yet been really impressed by the prospects of hard luck told with such shivering intensity here by Western aircraft folk.

Incidentally, hearings on the renegotiation law have been finished and the Committee of Ways and Means has gone into a huddle and will undoubtedly tack some modifying amendments onto the $12,000,000,000 revenue bill which is to be reported for enactment in December. But the renegotiation law will not be repealed.

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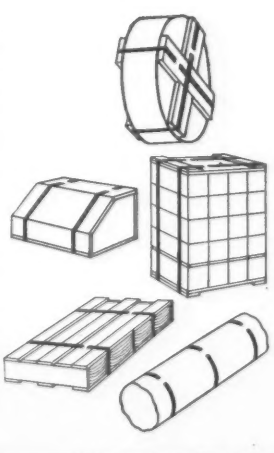

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Handicapped People Fill Gaps in Production Line

By HELEN KITCHEN BRANSON

AS MORE and more men are called into the armed forces, and the supply of women to replace them in industry is gradually being used up, employers are looking to the new field of handicapped labor and wondering just how and where handicapped people can be used to fill the production line gaps.

Since each type of physical handicap requires a different method of adjustment, it is convenient to divide this study into three general groups: (1) the visually handicapped, including the blind and partially blind; (2) the deaf-mute, or those handicapped by lack of hearing, and consequently of adequate speech communication; (3) the lame, or those crippled in back, legs, or hands.

Employment of the visually handicapped has long been considered impractical on a large scale. The fallacy of this policy has been shown to an indisputable degree by the successful employment of visionless workers in war industries.

Among the first West Coast industries to become interested in the employment of blind workmen was the Lockheed Aircraft Corporation. In cooperation with the Hazel Hurst Foundation for the Blind at Monrovia, California, and with the cooperation and supervision of Lockheed-Vega officials, Miss Hurst, herself blind from infancy, made a survey of jobs she felt blind people might be able to do.

She actually went into the factories and learned the various jobs, proving to the Lockheed-Vega management that blind persons could not only competently do the work at hand, but with the aid of well-trained guide dogs could go about the plant in complete safety and independence. So successful has Miss Hurst's program been that 350 visionless or partially blind workers are filling jobs mainly dependent on keen sense of touch at Lockheed-Vega, Goodyear and allied plants in California and Arizona. Filer-burrer, detail assembly in radio and other departments, counting of riv-nuts—are only a few of the positions these workers hold. Miss Hurst placed these people, and trained them in the work, thus relieving the companies of training responsibility.

Hazel Hurst Foundation places only blind people having competently trained guide dogs or those having traveling vision, since intricate corridors and moving machinery as well as crowded shift times make it impractical for her to place workers under any other policy.

C. L. Pelton, superintendent of fabrication at Lockheed, says of the blind workmen: "Your (Miss Hurst's) placement of blind and partially blind workers in our factories has been completely successful. My foremen are pressing me now for more of your people. . . . I am convinced that many of the present blind people plus the many more who are going to be coming home from the war can be rehabilitated mentally, given training and absorbed into industry where they will be self-respecting, self-sufficient individuals able to compete with sighted persons."

Eitel-McCullough, for many years manufacturers of radio tubes, is a company employing the blind under a little different plan. Unlike the largely assembly-line type of work at Lockheed-Vega, the "Ei-Mac" plant uses a group method of manufacture and assembly. Similar to the Hazel Hurst program in that blind Einar Magdiel, Utah Coordinator for the Adult Blind, surveyed the work and trained the visionless employees, but different with respect to organization, most of the blind are employed in a single department over which Mr. Magdiel acts as foreman.

In this way, Mr. Magdiel can shift each person around, training him at various jobs, and finally placing him permanently in the type of work he can best do; when work is slack, this permits the blind to shift from one job to another, which is one disadvantage of the one-job training program. Mr. Magdiel says that his plan was possible because the Salt Lake "Ei-Mac" plant is comparatively smaller than the Lockheed-Vega plants.

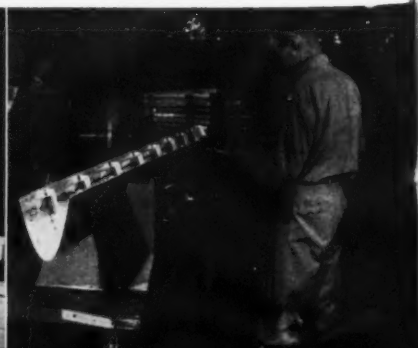
His program releases more than thirty sighted workers for jobs requiring vision. The blind have proved to be so efficient at filament cutting on a gauged jig, cutting glass beads on a gauged machine, stretching grid rings, stringing beads on filaments, and horn cutting that the blind department handles all this work at the Salt Lake plant.

Proving that his workers are not necessarily limited to his own department, Mr. Magdiel has also placed several workers in departments doing identical jobs with the sighted. Filament winding on a gauged winder, carton assembly, and packing are among the jobs the blind can do along with the sighted at Ei-Mac.

War factories in Utah have also absorbed more than 80 visually handicapped workers, in addition to the Ei-Mac employees. Utah Army Service Forces Depot and the Ogden Arsenal have hired blind workers. At the depot, assembling and waterproofing boxes was done by visually handicapped. The Ogden Arsenal used them to help in the manufacture and packing of shells and bombs, etc.

The commanding officer at the Ogden Arsenal, in cooperation with blind Murray B. Allen, Utah supervisor for the Adult

• EFFICIENT WORKERS—(Left) Raymond Hastings, totally blind, employed at Payne Furnace & Supply Co., Beverly Hills, Calif., is being instructed by Hazel Hurst (also totally blind), president of Hazel Hurst Foundation for the Blind at Monrovia, Calif., who made the placement at Payne. She uses as guide dog "Bonnie," trained at the Hurst Foundation. (Center) These girls are inserting primers into cartridge cases in a shell loading plant at Ogden Arsenal. Girl at the machine has full eyesight, but girl at the right is totally blind. She is testing the primer with her fingers to ascertain that the primer is flush with, or below, the base of the cartridge case. (Right) Charles Kime, totally blind graduate of the Hurst Foundation (with guide dog), employed at Lockheed, Burbank, Calif.



Blind, placed these blind people; so successful were the blind that other handicapped were employed. Deaf-mutes have been used to load and unload box cars. Of his handicapped employees, the commanding officer said: "They are the best example I know of good workmen; they are cheerful and eager to do good work, never grumbling, but always working at the job, never soldiering."

Workers with auditory handicaps were given orders by writing and signing. Some lip reading was used, but since all deaf-mutes can not lip read, and since it is impractical where the work is extremely mobile, writing and signing are the methods found to be most applicable. The deaf-mutes are particularly good at manual labor, and can usually do all sorts of hard work. Unfortunately when the arsenal changed from manufacture to storage, it was necessary to release some of the handicapped workers.

G. W. Eade, manager of the Eade Garment Company of Pasadena, California, employs a mute worker in his sewing room. He says she is fast and painstaking in her work. "Never disturbed by her surroundings, this woman works her full quota of hours, never wasting time," says Mr. Eade. Practice in training mute workers has shown that it generally takes a little longer because of slow communication, but once they learn a job they do it very well, paying special attention to the details and looks of the thing. Vocational Rehabilitation officers says the deaf-mutes are particularly efficient at work with the hands.

Mr. Eade also employs a woman crippled by infantile paralysis. Experienced in garment work before being maimed by the disease, she found on returning to work that her crippled legs and hands would not allow her to produce her full quota of work as required by the law.

She and her employer, Mr. Eade, applied for a handicap certificate which allowed him to pay her according to her ability to produce, rather than under the regular code. "When she first returned to work," says Mr. Eade, "we tried her on work we thought would be easy for her. We found that turning belts and similar work could not be competently and swiftly accomplished by her crippled hands. We tried her around on other jobs until we found what she could do, then let her do that type of work."

Mr. Eade feels that his handicapped workers are definitely an asset to his plant. "They are good for the morale of the other workers," he says. "They are loyal, conscientious, and with patience and training in lines which best suit them they will produce more than their share. My lame woman now makes better than her code requires. She has stayed with me under all conditions; she once forfeited a vacation so that we could get out a government order on time."

The western division plant of the Irving Subway Grating Company, manufacturers of portable landing mats for the air forces, report that the deaf-mute workers in their plant are averaging 25 to 35 per cent more efficient production than the normal workers with whom they compete.

Coast Chapter of Fire Association

A Pacific Coast chapter of the Wire Association was organized at a meeting in San Francisco October 29. Richard E. Brown, executive secretary of the association, was in attendance from Stamford, Conn., and a paper on "Fine Wire Drawing," prepared by R. R. Preston, die service engineer of The Carboloy Company, was read by Ray D. Mack, Pacific district manager for Carboloy.

The organization committee consisted of Mr. Brown, Mr. Mack, Earl R. Potter, superintendent, California Wire Cloth Co., South San Francisco, who acted as chairman of the meeting, Emerson Spear, vice president of Pacific Wire Rope Co., Los Angeles, Harry T. Hartwick, engineer, Firth-Sterling Steel Co., Los Angeles, T. H. McSheehy, sales representative, Wickwire Spencer Steel Co., San Francisco, and K. H. Davis, president, K. H. Davis Wire & Cable Corp., Los Angeles.

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WESTERNERS AT WORK...

Arizona

Joseph A. Wilcox, manager of the Shattuck Denn Mining Corporation, Bisbee, has been appointed member of the advisory committee of the zinc division of the War Production Board. . . . Harry C. Loesche has been named associate mining engineer with the safety division of the United States Bureau of Mines, Phoenix. He succeeds Paul W. Clymer, who has been transferred to Seattle.

California

C. J. McDonald appointed assistant to A. T. Mercier, president, Southern Pacific Company. . . . Henry J. Kaiser elected president Brewster Aeronautical Corp. . . . Maury Schwartz, former assistant manager American Smelting & Refining Co., has become general manager of Pacific Smelting Company, Torrance, Calif. . . . Charles L. Wheeler has been elected to the newly created position of executive vice president, Pope & Talbot, Inc.

T. E. Ivey, vice president of California Bank, has been appointed state vice president for California of the American Bankers Association. . . . John Hauerwaas, newly appointed president of United States Steel Products Company, formerly Boyle Mfg. Co., has announced appointment of T. McGahan as vice president and general manager of sales and A. E. Klieves, vice president in charge of operations, Los Angeles.

Harry McClelland appointed vice president, Bank of America. . . . John G. Watkins made manager of Kauai Pineapple Company, succeeding R. G. Bell, appointed assistant manager of Alexander & Baldwin, agents for Kauai Pineapple Company. . . . E. D. Thompson appointed assistant general sales manager, Standard Oil Company.

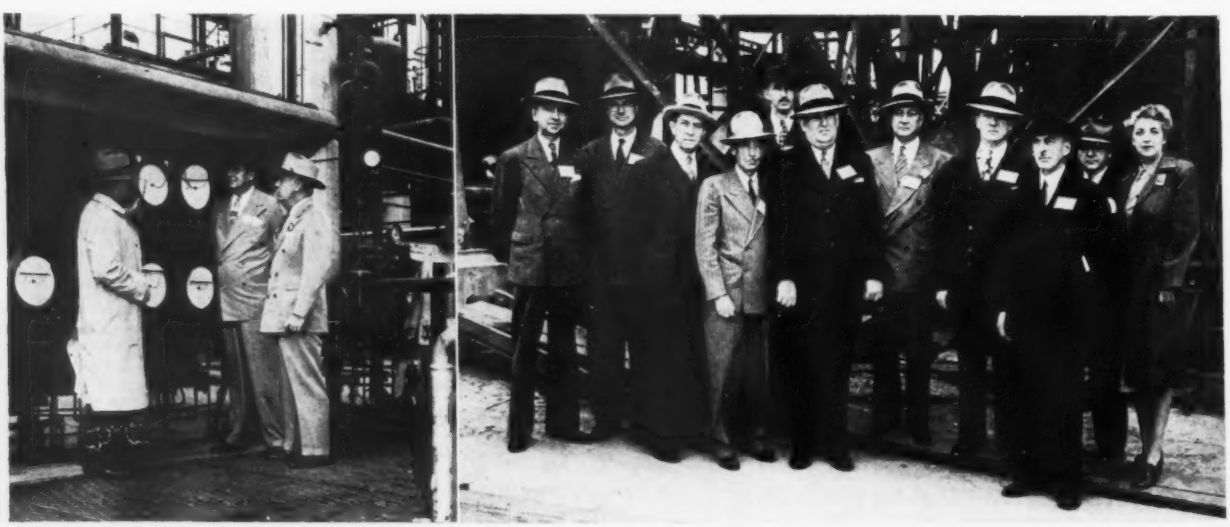
Walter F. Haggman, Foundry Specialties Company, has been elected president, W. D. Bailey, Jr., Westlectric Castings, Inc., vice president; E. M. Hagener, General Metals Corp., secretary, and Robert E. Haley, Advance Aluminum and Brass Co., treasurer of Southern California Chapter, American Foundrymen's Association. . . . Herbert E. Gray, president of Barron-Gray Packing Company, has been elected president of Canners League of California, and Merritt A. Clevenger, vice president.

T. L. Kishbaugh, who had been loaned to WPB, has returned to Los Angeles to resume his duties as vice president, Earle M. Jorgensen Company. . . . Albert E. McIntyre, former assistant factory manager has become factory manager, Caterpillar Tractor Company, San Leandro plant. . . . Burrell S. Manuel, Southern California district manager, Westinghouse Supply Company, has been elected vice president of the company.

R. W. Longstreth appointed regional representative of WPB's Office of Civilian Requirements. . . . W. D. Cloos transferred to WPB regional offices in New York. . . . Lawrence R. McNamara promoted to assistant district manager, Los Angeles ODT Division of Motor Transport District Office. . . . Edward K. Garrison has been appointed Pacific Coast regional manager of Tank Car Service Section of the Division of Petroleum and Other Liquid Transport of the Office of Defense Transportation. Los Angeles field office of Tank Car Service Section has been established under management of Forrest O. Moore.

Mort Bach, works manager at Vega Aircraft, has been brought back to Lockheed as works manager, relieving John H. Sreenan from that post to become general superintendent of outside plants, and George H. Prudden, assistant works manager at Vega has succeeded Bach as works manager there.

Dr. J. A. C. Grant, University of California professor, has been appointed vice-chairman and to full-time membership on the 10th RWLB. . . . E. L. Payne, vice-president and general manager, Payne Furnace and Supply Company, has been elected president of Pacific Coast Gas Association; O. R. Doerr elected vice-president and D. G. Martin, treasurer. Both Doerr and Martin are from San Fran-



• At Los Angeles Refinery of Union Oil Company of California: P. H. Wilson, assistant superintendent of maintenance; Reese H. Taylor, president, and W. L. Stewart, Jr., executive vice president, Union Oil.

•At Sausalito yard of Marinship Corporation: Frank Kugelberg, foreign representative of Williams Dimond & Co.; Arthur Towne, of Blake, Moffitt & Towne; Charles Dostal, vice president and western manager, Westinghouse Electric; George Whitney of Whitney Bros.; Louis Lundborg, gen. mgr., Chamber of Commerce; Donald Russell, vice president, Southern Pacific; Ernest Ingold, president, Chamber of Commerce, and Chevrolet distributor; Dwight McCormack, general manager, Sherman Clay & Co.; Ralph Frisselle, western manager, Liggett & Myers Tobacco Co.; Sherwood Hall and Mrs. M. D. Sexton of Marinship.

cisco. . . . I. W. Hellman III, now a captain in the Army Air Corps, has been elected president of Wells Fargo Bank & Union Trust Co. While he is in the service, Frank B. King, senior vice president, will carry on the duties of the office.

Paul R. Jordan, general manager of Harvill Corporation, Los Angeles, elected vice president and general manager. . . . H. A. Van Norman, for many years chief engineer of the City Water Bureau of Los Angeles, has been named general manager of the reorganized Department of Water and Power. He has appointed W. W. Hurlbut and R. R. Robertson, deputy general managers. . . . P. F. Gillespie, Judson-Pacific Company, San Francisco, has been elected director of the American Institute of Steel Construction.

Carroll Wilson, vice president, Hills Brothers Coffee, Inc.; W. V. Lynch, manager, coffee department, W. R. Grace & Co.; Robert R. Quinlan, B. C. Ireland, Inc., and George C. Thierbach, president, Jones-Thierbach Co., all of San Francisco, have been appointed to the coffee industry advisory committee by OPA.

Colorado

Fred Jones, Denver, consulting mining engineer, has been appointed state commissioner of mines of Colorado. . . . H. L. Tedrow, general superintendent of the London Mines and Milling Company, Alma, Colorado, has been appointed to the Mineral Resources Board by Governor Vivian, as has also John W. Valentine, president of the Valentine Hardware Company, Boulder. . . . O. H. Metzger, mining engineer, has joined the staff of Union Mines Development Corporation, new Union Carbide and Carbon Corporation unit, with headquarters in Grand Junction.

Idaho

H. G. Washburn, Federal Mining and Smelting Company, has been appointed member of the advisory committee of the zinc division of WPB. . . . Charles Breckenridge, former manager of Fletcher Oil Company in southern Idaho area, has become lieutenant (j.g.) at the Boise station for naval recruiting.

Montana

Edward S. McGlone, general superintendent of mines in Butte, has been named to the newly created position of general manager of mining and metallurgical operations for Montana and Idaho by Anaconda Copper Mining Company. . . . H. J. Rahilly takes McGlone's old job.

Harry H. Olson, Great Falls, has been elected president of Pacific Northwest Housing. . . . Dr. O. E. Sheppard, head of chemistry, Montana State College, has been named chemist for the Montana Agricultural Experiment Station. . . . Palmer Johnson, Great Falls attorney, has been appointed conciliation commissioner for Cascade County. . . . R. P. Caples, Anaconda Copper Mining Company, has been appointed member of the advisory committee of the zinc division of WPB.

Nevada

Emile J. Gezelin has been appointed deputy superintendent of public instruction for the fourth Nevada district. . . . Kenyon E. Richard has been promoted to chief geologist of Consolidated Coppermines Corporation, Kimberly, replacing E. N. Pennebaker who has resigned but will remain on the staff as consulting geologist.

New Mexico

L. P. Wilsey, Albuquerque, has become fiscal agent for the North Pacific region of the U. S. Forest Service. . . . Joseph H. Taylor, Peru Mining Company, has been appointed member of the advisory committee of the zinc division, WPB.

Oregon

Clay Brown, formerly of Portland, has been appointed assistant to president, United States Plywood Corporation. . . . B. Van McTaggert, formerly with Inman-Poulsen Lumber Company, Portland, has been appointed purchasing agent of C. D. Johnson Lumber Corporation, Toledo, Oregon, succeeding Ed Tauscher, resigned. . . . S. L. Gregory, former assistant manager, Columbia Basin Sawmills and Columbia Basin Loggers, Portland, has become manager of the Redwood Industrial Relations Committee, Eureka, Calif.

Clyde M. Starr, formerly of Reno, has been appointed senior labor and material inspector under the Navy Department at Portland. . . . George H. Lewis, formerly associate enforcement attorney with OPA, Klamath Falls, has been transferred to the Portland district OPA office as head of the appeal and consumer goods section. . . . Alexander Mechlin has resigned his position with U. S. Maritime Commission, to become general manager of the Columbia Shipbuilding and Drydock Company at Portland and Columbia City.

Utah

W. R. McEntire, Huntsville, has been appointed member of the State Business Regulation Commission and Donald Hacking, Price, has been elevated to chairmanship of the Commission. . . . Percy H. Ramsden, Jr., formerly general manager of Congress Mining Corporation, Arizona, is with Canyon Copper Company, Kanab, Utah. . . . Thad Gordon has been appointed manager of Salt Lake zone, Chevrolet Motor Division, General Motors Corporation.

Fred A. Moreton, Salt Lake City, has been elected president of the National Association of Insurance Agents. . . . D. C. Houston, Utah Copper Company, has been named chairman of Public Health Committee, and D. O. Lamb, Sunfreze Ice Cream Company, has been named head of Dairy and Dairy Products Committee, Salt Lake Chamber of Commerce for 1943-44. . . . J. A. Cooper has been appointed manager of New Park Mining Company.

E. H. Snyder, Combined Metals Reduction Company, Salt Lake City; Cecil Fitch, Chief Consolidated Mining Company, Eureka, Utah; C. T. Van Winkle, Rico Argentine Mining Company, Salt Lake City, and W. C. (Pat) Page, U. S. Smelting, Refining and Mining Company, Salt Lake City, have been appointed members of the advisory committee of the zinc division of WPB. . . . John R. Talmage, former managing editor of The Desert News, has become a Lieutenant (j.g.) in the U. S. Navy in the Supply Department.

R. A. Hart, former industrial secretary of the Salt Lake Chamber of Commerce, has been made state manager of the Utah district of the Committee for Economic Development. The state committee of CED is headed by W. J. O'Connor and Gus P. Backman. . . . Colonel W. A. Capron has arrived at Ogden Arsenal to assume command.

Washington

Philip G. Johnson, Boeing Aircraft Company, has been appointed Pacific Coast regional vice chairman of the Committee for Economic Development, to have jurisdiction over Washington, Oregon, Idaho and Utah. . . . L. K. Larson, sales manager of the pulp division, Weyerhaeuser Timber Company, Longview, has been named member of OPA's wood pipe advisory committee. . . . Rear Adm. James A. Alger, who had retired from the Coast Guard, has been appointed special representative on the Pacific Coast of the coordinator for ship repair and conversion.

Jack R. Rehm has been named treasurer; M. M. Pattison, secretary and T. R. Anderson, comptroller, Harbor Plywood Corporation, Hoquiam. . . . John H. Thomas, manager of United States Employment Service office in Spokane, has been named area director for the War Manpower Commission in Washington east of the Cascades. . . . J. Jensen, Pend Oreille Mines and Metals Company and E. W. Jamison, Sierra Zinc Company, have been appointed members of the advisory committee of the zinc division of WPB.

Wyoming

Lawrence Murray, Cheyenne, has become Laramie County Labor Supervisor in the County Agent's office, which position was held by N. C. Johnson, superintendent of the Carpenter schools, during the summer.

Successful Experience With Wage Incentive

THE successful experience of the Seaboard Coil Spring Corp. of Los Angeles with a wage incentive plan, exceeding the expectations of both management and employees, was reported recently in Wesley Smith's *March of Finance* in the Los Angeles Times.

Because of declining production and delayed deliveries, approval for a wage incentive plan was granted by the War Labor Board in September and made retroactive to August 1. The account of the experience reads as follows:

"Employees had been notified in August of the management's efforts to get the authority for the inauguration of the plan and production began to climb that month, increased in September and in October ran about 20 per cent above the average monthly output for the first half of the year. The increased production has been scored with a smaller average number of employees and with approximately 15 per cent less total man-hours.

"The bonus to employees, which is paid on the basis of the percentage increase over the standard of productivity per man-hour and is applicable only to straight time, figured out at 7 per cent in August, 12 per cent in September and 43½ per cent in October.

"The average bonus paid to women workers last month was around $52 and to men workers about $59. In the case of women employees on a 75-cent-hour straight time basis with the usual time and a half paid for the sixth eight-hour day, the bonus brought their earnings for a four-week period up to around $208.

"P. C. Holnback, president of the company, reviewing the results achieved, recalled the situation faced before the wage incentive plan was adopted.

"The plant was working nine hours daily, six days a week, using two shifts. The average number of employees in the first half of the year was 165. The production curve had dropped to the point where deliveries were behind schedule and the company was barely breaking even. Employees' morale was low and there was considerable loafing, absenteeism and labor turnover.

"Discouraged at the failure of efforts to increase output, Mr. Holnback, on his return home one evening, was asked by his wife why he did not read a magazine article in which Charles E. Wilson of the WPB outlined his views on wage incentive plans to increase war production. And, as his wife had indicated, he found the answer to his problem and went to work on it.

"The standard of productivity per man hour was figured on the basis of the average man-hours worked and the total net sales in the first half of the year. The percentage by which this standard is exceeded in any one month is applied to straight-time hours worked to determine the bonus.

"The plant is now operating on an eight-hour day basis, six days a week with only one shift. The average number of employees is 131. This compares with an average of 165 employees in the first half of the year when the plant was running two shifts on a nine-hour basis, six days a week. At first some of the employees complained about losing the extra daily hour with time and a half pay but they soon realized the greater benefit of the incentive plan.

"The company is starting to reduce the

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prices of its products, which are fixed by OPA and which have not been increased. On some of the items on which losses were formerly the usual thing, the red ink has disappeared. The increased efficiency of the employees is bringing production costs down to a level that presages the company's ability to meet the most highly competitive prices in the post-war periods. In brief, on all counts the incentive wage plan has achieved its objectives."

Production Control . . .

Not a Panacea, But a Basis From Which Management Can Make Intelligent Decisions

By TREVOR GARDNER*
Supervisor, Development Engineering Dept., California Institute of Technology

SINCE the time of Frederic Winslow Taylor, there has been a controversy between the "kicking it through the shop" school of production men and the "functionalized" production thinkers.

The first group relies very little upon paper work; believes that operation sheets and bills of materials are unnecessary refinements; and gets production out by brute strength and awkwardness.

The latter group contends that the shop supervisor's job is to build parts "at the rate and to the quality specified by management." They further contend that the production control function is one of *service* just as is the purchasing and accounting function. The groups to be served are:

1) Man on machine
2) Shop supervisor
3) Top management

Functionalized view of production control takes the stand that most foremen, leadmen, or shop supervisors do not have adequate over-all company perspective to make the necessary decisions incident to routine shop scheduling and dispatching. For this reason as well as others, it is felt that production control performs for the supervisor "a job which he does not have time to do well himself."

Definition of Terms

The field of systematic production control is a comparatively new one and the nomenclature and terminology has not yet been standardized. For this reason each of us places a different interpretation on even such basic terms as "Production Planning" and "Production Control." For the purposes of this discussion, it is desirable that we reduce the understanding of these two terms to a common denominator. The following definitions are offered for consideration:

1) Production Planning—the practices and techniques commonly used in picturing ahead the detailed sequence of manufacturing operations so that the right work will get done in the right place at the right time. (Management itself implies over-all planning of a complicated nature. However, when we refer to Production Planning we think of a series of techniques designed to accomplish the detailed planning necessary to successfully operate a manufacturing shop.)
2) Production Control—Production Control is used to describe many systems which are aimed at the regulation of flow of production through a manufacturing plant. Most of these systems, however, do not have in them the necessary element of control since control implies that:
   a) Facts be available in advance of action.
   b) The available facts be referred to and understood by its members so that management can be responsible for taking action.
   c) Many of the control systems in current use are merely good record-keeping or historical data organizations.

Present Day Needs for Production Control

In the pre-war days, the need for systematic planning and control was reasonably great and many local companies had installed production control systems. With the great advent of war and the speed-up of delivery demands, it has become apparent

*Paper presented at the October 31 meeting of the Southern Calif. Management Conference at U.C.L.A.

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PRODUCTION CONTROL *(From Pg. 47)* that most organizations that were addicted to the "kicking it through the shop" system have consistently fallen down on their proposed production schedules and delivery promises.

Because of this, the various armed services have initiated requests that such corporations and industries install some types of systematic production records and controls. This force has been a powerful one and has been accelerated since the Los Angeles area has been declared the No. 1 critical labor area with the exclusion of additional government contracts.

The Controlled Materials Plan, commonly known as the CMP plan, is creating a terrific demand for additional production controls. It does this in the following ways:

1) Requires a detailed Bill of Materials for each product.
2) Requires an estimate of "lead time" for each part in each product.
3) Requires ninety-day inventory reports.
4) Requires that management keep its work in process to a minimum.
5) Requires that management keep its inventory of controlled materials to a sixty-day level.

All these factors have accelerated the demand for some type of systematic planning and control and the results have been that the corner drugstore has been deluged by requisitions for production control formulas which can be painlessly taken in a sugar-coated fashion to solve all the ills of poor management.

Many companies are discovering to their sorrow that a production control system is not a panacea but rather merely an additional crutch for management to lean upon. It will not and cannot increase the production of an already over-loaded shop; nor can it accomplish miracles in the way of running the shop for an indecisive management. It can only provide the systematic approach and accurate facts needed to make intelligent management decisions.

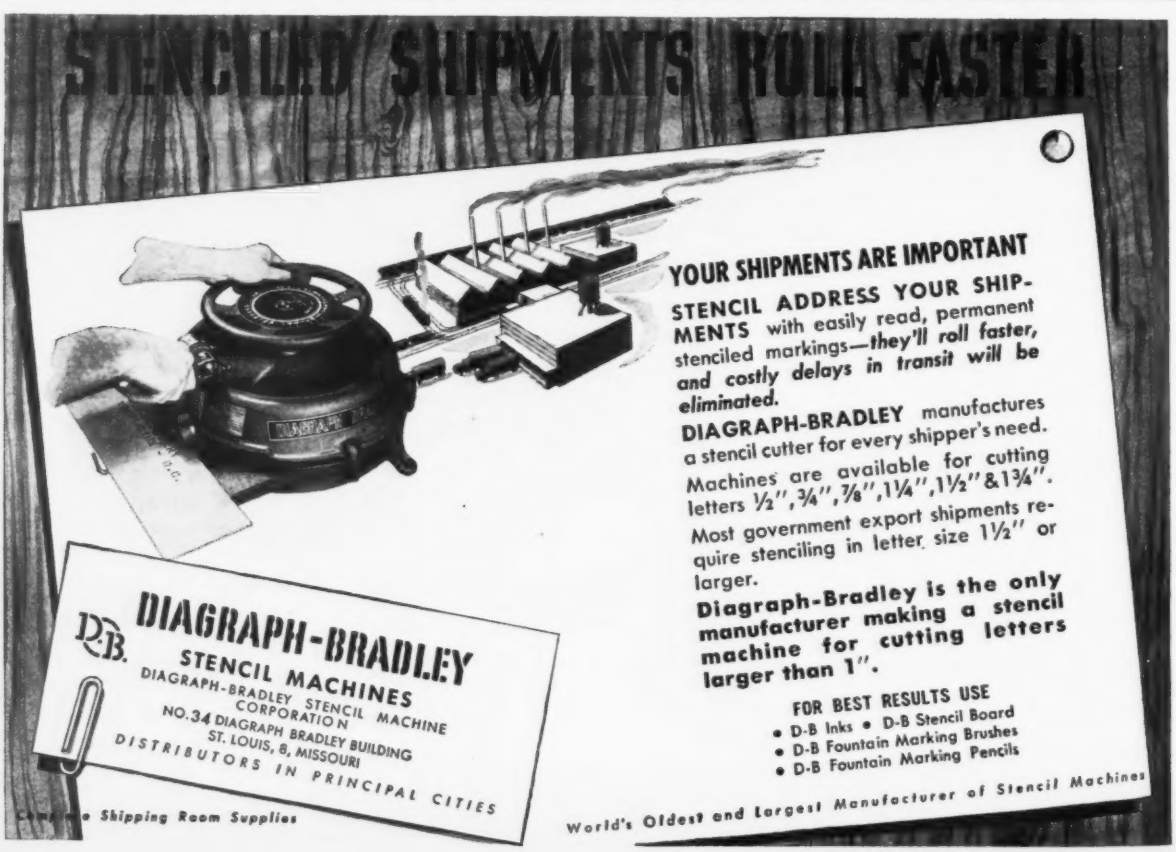
Too frequently the production control function in an organization is not granted the authority which goes with the responsibility for control. As a consequence, the control organization becomes apathetic and weak. However, when provided with the authority to carry out its responsibilities, systematic production planning and control can perform many services for the industrial organization:

1) Services for the worker
   a) Removes the need for searching for the next job.
   b) Has production tools pre-prepared at the tool crib.
   c) Reduces lost time due to tool set-ups which do not work or are not ready.
   d) Reduces amount of physical labor required since the right job will be *planned* to the correct machine.
   e) Gives additional opportunities to spend productive time "on standards."
   f) Brings the work to the operator and takes the finished work away.
2) Services for shop supervisor
   a) Performs detailed shop planning.
   b) Plans and checks in advance of production the quality and availability of production tooling.
   c) Takes the worry about the "job ahead of machine" off the shop supervisor's shoulders.
   d) Provides continuity of planning and action between shifts.
   e) Gives the supervisor more time to do those jobs which he is best equipped to do.
3) Services to top management
   a) Provides an over-all picture of shop loading and determines the backlog hours by machine group (as opposed to normal picture of dollars backlog which is a basis for many management blunders).
   b) Provides guidance information as to personal needs.
   c) Provides guidance information as to machine capacity for purchasing or for contracting purposes.
   d) Provides a coordination between other branches of management to bring about correct execution of the top management's production schedules.

Principles of Planning

Through the 40 years of development of functional production control, a number of outstanding planning principles have been evolved. Some of these may be summarized as follows:

1) Detailed and routine operation and tool planning must precede the issuance of orders and instructions to a shop.
2) Work must be planned direct to a machine or machine group.
3) The planning mentioned in (1) above must be complete so that it provides the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operation description, type of machine on which the work is done, tooling setups necessary to perform the work, the production method to be used and the time standard that will apply to this production method.

4) The production dispatching organization must be vested with the authority to police the planning done by the planning group and deviations from operation sheets must be at the discretion of a production control function.
5) The operating head of production control must be an executive of equal rank with the highest operating head of the factory shops.

Principles of Control

1) Shop records must reflect the condition within the shop within a half a day.
2) Material control records must reflect the actual condition in the stock piles within twenty-four hours.
3) Basic shop action should be dispatched from a central scheduling board.
4) There must be only one place to go to get information concerning any specific shop order (this place should be the production control office rather than the shop floor).
5) The preparation of production tooling must precede the issuance of orders to the shop and its availability must be verified when an operation is dispatched to the shop floor.
6) It is desirable to release the authority to manufacture in small pieces rather than all at once (operation job tickets as opposed to the complete shop order).

Obstacles to Both Planning and Control

A few of the obstacles to systematic planning and control of production have been mentioned already but the outstanding obstacles that are slowing down many production control departments and hindering them in the performance of their proper task may be summarized as follows:

1) Not enough authority given to the operating head of production control.
2) Shop is not required to follow operation sheets.
3) Shop foremen and shop dispatchers frequently feud instead of attempting to exercise complementary control.
4) The desire frequently exists to build an elaborate paper system and to make the shop serve it rather than to devise a plan which will "serve the shop."
5) Incompetent personnel is often assigned to operate various phases of the production control function.

It has been observed that many production control departments are treated as a "catch-all" for misfits from other departments.

Management frequently expects a production control function to bring about order and system without stepping on any one's toes, changing organizational lines, or in any way disturbing the status quo no matter how inadequate it might be.

Only a few managements realize that to have real control it is necessary to withdraw a portion of the authority from the shop operating heads and to centralize this authority in the operating head of the production control system. It is almost axiomatic that unless this is done the best that can be hoped for is a production history system rather than a production control system.

Army-Navy Awards

Two well- known Western firms had ceremonies last month for the presentation of Army-Navy "E" awards, Payne Furnace & Supply Company, Inc., of Beverly Hills, and Soule Steel Company of San Francisco.

The Payne company first made heating equipment for army camps and then turned to field photographic equipment for the Army Air Corps, airplane parts and other items. Major Walter F. Zwick made the presentation Nov. 5, and E. L. Payne, vice-president and general manager, formally accepted. Among those present were four handicapped workers, three men and one woman who are totally blind.

Landing barges have been the war-time product of Soule Steel Company, and the Army-Navy burgee was presented on Nov. 20 by Rear Admiral W. L. Friedell, commandant of the Mare Island Navy Yard. Edw. L. Soule, president and founder of the company, accepted. Army-Navy "E" pins were given to the workers by Lt. Col. Carlos W. Huntington.

Pacific Gear and Tool Works in San Francisco had a ceremony for their Army-Navy "E' award on July 31 last, Captain A. B. Court, USN, inspector of naval materials at San Francisco, bestowing the flag and President Phillip L. Bannan accepting on behalf of the company. A feature of the occasion was a congratulatory cable from Lieut. Bernard Bannan, one of Mr. Bannan's six sons, who is in Italy with the ordnance department.

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West Coast Shipyard Pay Raises Granted

In an effort to equalize wage rates in the 56 West Coast shipyards, the War Labor Board has approved proposals of employers and labor unions which will result in pay increases for approximately 28,000 of the 400,000 employed. Through equalization of certain rates the yards will be able to move employees from one job to another and thus speed up production, effecting economies which will save procurement agencies from $50,000,000 to $75,000,000 a year.

The board approved, with one modification, the agreement submitted by the AFL and the employers. The modification provided that the basic hiring-in rate for labor shall remain at 88 cents an hour with progressions, whenever such labor is productive labor, to 92 cents after 30 days and to 95 cents after 60 days. The parties had proposed a flat 95 cent hiring-in rate.

Workers benefiting from wage increases will do so through reclassification, a member of the board explained. He emphasized that it was not a general increase, and that if spread over the entire industry, the additional pay would amount to only three-fourths of a cent an hour.

1 Year Retroactive Raise

More than 4,000 Arizona and New Mexico workers, representing nearly all lumber and sawmill employees in the two states, have been informed by the 10th RWLB that they will receive almost a years retroactive pay hike of 7½ cents an hour.

Douglas Credits System

Attributing the company record of streamlined methods of salvaging every available manhour through a labor-dispatch system, Douglas Aircraft Company met or bettered all government schedules for October in aircraft production. The company turned out more B-24 Liberator bombers than in any previous month, and equaled its best previous output of both B-17 Flying Fortresses and the giant C-54 transports.

Boeing Branches Given Raises

The wage rate granted Boeing Aircraft employees by the NWLB will apply to the production departments of the Aberdeen and Bellingham branch plants. All members of NWLB, including labor, had meant the original order to include the Seattle and Renton plants as they did not know there were to be other branch plants.

The national board expressed the fear that if the same drawing power were extended to branch plants, the economic life of their communities might be upset and therefore where additional branch plants are established, the question of their wages is to be referred to the 12th regional board. However, because the directive already had been interpreted by the Boeing Company and unions, to include the Bellingham and Aberdeen plants, and Seattle rates are already being paid there, the board consented that its decision shall also be interpreted to apply to them.

Tacoma Yard Cuts Absenteeism

A vigorous campaign among shipyard workers, coupled with a new method of computing absences, has reduced absenteeism at the Tacoma yards of the Seattle-Tacoma Shipbuilding Corporation by 2.6 per cent according to George Kachlein, Jr., assistant general manager. He attributed about half the decrease to an educational campaign to impress the workers with the importance of being on the job regularly. The rest of the decrease he said was probably due to employing the standard Navy method of checking yard attendance.

Under the Navy method, men who are absent because of injuries suffered on the job or who have been suffering from long illnesses, are not listed as absentees. Previously the Tacoma yards had assumed that anyone who was not on the job for any reason at all, other than regular vacation time, was an absentee. Recently the Tacoma division discharged 250 chronic absentees in a single day.

Enforcement of Fair Labor Standards Act

Enforcement of the Fair Labor Standards Act brought restitution of $2,792,726 in wages in California, which includes close to 2 million dollars in payments by the movie industry, illegally withheld from employees covered by the Act, from the time it became effective on October 24, 1938, to September 30, 1943. The Act, also known as the Federal wage hour law, regulates the minimum wage as 40 cents an hour, and sets the overtime rate of time and a half after 40 hours a week. The following figures show restitutions from some of the Western states:

	Total Restitutions	*No. of Employees*	*No. of Firms*
California	$2,792,726	47,711	2,313
Washington	488,876	12,944	997
Oregon	470,887	12,888	780
Utah	100,452	3,246	170
Idaho	187,633	3,850	272
Arizona	169,726	2,131	116
Nevada	27,830	535	33

• Among those entering an exhibition of shipyard art staged by Marinship Corporation, Sausalito, Calif., featuring work of more than 75 employees were: Delmar Gray, specialty engineer, who has caught a woman welder lifting her helmet just as the whistle blows at end of shift; Michael Knudsen with a cartoon portrayal of shipyard life; and William Hamilton, member of Marinship Sub-assembly gang, shown putting the finishing touches on his oil painting of the yard's first tanker, the "S.S. Escambia."

Pre-Construction Contract Validity Upheld

Holding that building trades contracts signed prior to the actual hiring of workers are valid and binding is a decision of outstanding importance that has been handed down in the Geneva Steel case by Judge William L. Knous, Associate Justice of the Supreme Court of Colorado, appointed by the National War Labor Board to hear the case. The decision is also noteworthy in that the Judge indicates the importance of not disturbing any contractual relations during the present emergency.

The controversy was brought about by the petition of the United Brotherhood of Welders, Cutters and Helpers of America to the Utah Labor Relations Board for certification as representative of those working with the welding torch and electric arc employed by Koppers Company, one of the contractors on the project. The Utah LRB certified the United Welders as representatives for those using the above tools 50 per cent or more of the time. On June 12 a work stoppage resulted, 500 Koppers Company employees walked off the job. When the employees returned to their jobs the matter was referred to the War Labor Board who appointed Judge Knous to hold hearings. The decision was that the contract signed by Utah-Pomeroy-Morrison Company with the AFL unions, even though entered into at a time when only a handful of employees were actually employed on the job, was valid and binding.

Haggerty and Noriega Elected

C. J. Haggerty of Los Angeles has been chosen executive secretary of the State Federation of Labor (AFL). Haggerty resigned the presidency of the federation to accept the office left vacant by the death of Edward D. Vandeleur.

Anthony L. Noriega of San Francisco was chosen to succeed Haggerty as president. Noriega is also secretary-treasurer of the California State Theatrical Federation.

Wage Adjustment Board is Revived

The NWLB has reconstituted the Wage Adjustment Board to handle its new wage policy in cases involving workers in both private and government-financed building construction industries.

The Wage Adjustment Board of nine members, three each for labor, industry, and the public, will have jurisdiction over labor disputes and over voluntary wage and salary adjustments.

Hold Church at Shipyard

Workers at the Swan Island shipyard can now go to work and church also on Sunday because Henry J. Kaiser, shipbuilder, has arranged for sermons to be held at this tanker-producing yard regularly each Sunday.

Kaiser Signs New AFL Wage Contract

A contract has been signed between the Kaiser Company and the Office Employees Union, AFL, to provide pay increases retroactive to February 6 to all clerical employees of the Swan Island, Oregon Shipbuilding Corporation and Vancouver yards.

The union has had a contract covering only time checkers in the past. The new contract also gives basic pay increases to these employees. An appeal by the union and company for premium pay of 10 and 15 per cent for swing and graveyard shift workers, respectively, for night clerical workers is the first granted for clerical workers on the West Coast.

Increase Granted Oregon Drivers

WLB's trucking commission has approved increases of 30 cents a day for over-the-road drivers in Oregon, and 50 cents a day for city drivers in Portland, retroactive to March 1, the date of expiration of a previous contract.

The decision covers about 2500 employees or members of the truck operators league of Oregon, as well as other operators who have been paying the same wage scale.

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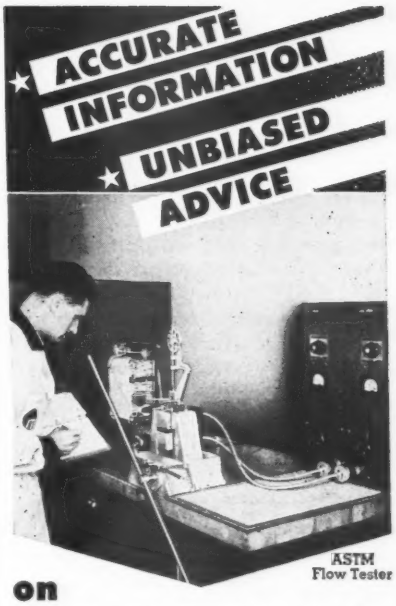

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7-Day Balanced Work Week at Moorship

A seven-day balanced work plan of operation in connection with new construction, maintenance work and special activities has been inaugurated in both East and West yards of Moore Dry Dock Company. This plan enables most of the employees, including foremen, quartermen and leadermen to be off on the same day, and for the majority that day will be Sunday every week. There is no change in the number of days regularly worked each week.

Maintenance crews and other workers engaged in special activities requiring them to work on Sundays have a regularly assigned day off during the week.

RWLB Action on Hotel and Cafe Wages

No hotel or restaurant employing eight or fewer persons in California, Arizona and Nevada, may increase or decrease hourly wage rates without first obtaining official approval from the 10th RWLB in San Francisco. Employers of more than eight persons already have been operating under the controls designed to ease disruptive pressures for higher wartime wages and prices.

This RWLB action followed hearings held at the request of the Southern California Restaurant Association and the California State Hotel Association Ltd. of Los Angeles, who requested the action on grounds that larger restaurants could not compete for workers due to high wages paid by small eating places.

CIO Wins Election

Workers of the Bendix Aviation, Ltd., North Hollywood, have voted the International Union, United Automobile, Aircraft and Agricultural Implement Workers of America, Local Union 24, U.A.W., CIO, as their official representative.

Wage Rates Fixed For Oil Drillers

NWLB has established uniform wage brackets of "approvable rates" for five rotary oil-well drilling occupations in Colorado, Wyoming, New Mexico, Utah, Idaho and Montana.

The hourly rates are: Driller, $1.58; derrickmen, $1.10; enginemen and firemen, $1.05; floorman and roughneck, 99 cents. These rates are for the guidance of regional boards in considering wage adjustment cases in the industry, and may not be put into effect by companies without approval of the WLB.

Douglas Employees Vote

Guards at Douglas Aircraft Company's El Segundo works have elected the AFL International Association of Machinists as their bargaining agent. Cafeteria workers at the same place voted for the AFL Culinary Workers' Union.

WLB Rules Unions Must Be "Protected"

Statement by WLB that unions are entitled to protection during the war because they are not free to use their economic strength through strike action, was made in support of a regional WLB decision requiring 51 per cent of the employees of two California oil companies to be union members.

The union involved is the Seafarers International Union of North America (AFL), which operates tankers of the General Petroleum Company, and Richfield Oil Corporation, Los Angeles.

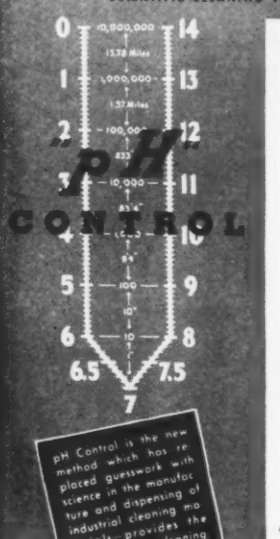
Pay Gains For Rolling Mills

The Northwest RWLB has announced amended wage rates for the Oregon Electric Steel Rolling Mills of Portland, a new plant, retroactive to the date on which plant operations began.

The board, which had previously authorized $1.25 for electricians, $1.20 for machinists, granted the company permission to pay premium rates of $1.35 for both electricians and machinists. Shearman helpers were raised from 94 cents to $1 per hour; furnace leaders to $1.10 an hour from 92 cents. The company's request to increase the common labor rate from 88 to 95 cents was denied, with a rate of 90 cents an hour authorized as an alternative.

KELITE

SCIENTIFIC CLEANING THROUGH pH CONTROL



pH Control is the new method which has replaced guesswork with science in the manufacture and dispensing of industrial cleaning materials—provides the key to scientific cleaning.

KELITE PROCESS K DOES THREE JOBS IN ONE SOAK

1. Removes Grease, scale, corrosion.
2. Insures superior plating & paint adhesion.
3. Inhibits rusting.

No critical time element is involved in the use of this new product of Kelite pH Control. Process K is easy to handle. It thoroughly removes undesirable deposits, leaves the metal with a tooth which is highly acceptable for plating or painting and inhibits the action of rust.

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Send for full information NOW

KELITE PRODUCTS, Inc. • 909 East 60th St., Los Angeles 1, Calif.

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Company_____

Address_____

K

"BANDAGE" YOUR ROOF LEAKS

PABCO HYDROSEAL and...PABCOWEB

PABCO HYDROSEAL is a durable, heavy, adhesive black plastic. Simply spread HYDROSEAL over and around crack or leak and "bond" it with a strip of PABCOWEB (which comes in different widths, like bandages!) You can "bandage" many types of leaks and make them thoroughly waterproof. Use for roofing gutters, skylights, lightwells, tanks, pools, flashings and walls.

Ask your dealer. Write for BOOKLET "M"

PABCO

THE PARAFFINE COMPANIES, INC.
475 Brannan Street, San Francisco 19, California

Aircraft Workers Expect to Stay

From 80 to 90 per cent of the men and 75 to 90 per cent of the women interviewed in a recent aircraft plant survey in Southern California expect to remain on the coast after the war.

Five hundred workers were interviewed in all, and from 40 to 50 per cent of these came from the middle west, Oklahoma ranking first and Illinois second. The majority had lived on the coast less than three years and 20 per cent of them less than one year.

Forty per cent of the women interviewed were married, and more than half of the married women had children. More than half these women factory workers had never worked before, while 10 per cent had worked in plants, another 10 per cent came directly from school to war work, and 75 per cent of the women office workers had been in similar work before.

From 40 to 50 per cent of the women said they would like to continue working after the war. Between 25 and 30 per cent of the workers, including both men and women, own their own homes already, while from 75 to 90 per cent plan or hope to build homes within the first three years after the war.

To the question, "What will you do with your war bonds?" the following answers were received:

Farm or small acreage	18%
Home	17
Education for self or children	10
Invest in a business	9
Travel	2
Retire	2
Undecided	38

1943 Labor Peace Record For San Francisco

San Francisco's labor peace record for 1943 looks to be among the best for any large industrial center of the nation. For the first nine months this year, according to report of the San Francisco Employers' Council, only four strikes were brought to its attention. Of these, two lasted only one day each, the other two, four days each. All the four strikes occurred in approximately the first four months, there having been none reported to the council since early May. The record of four brief strikes this year compares with 13 strikes in all of 1942, and 44 in all of 1941.

Report of the council is especially significant of the whole San Francisco labor situation since relations between labor and industry are organized collectively between employer groups and labor unions to a greater extent than in any comparable community in the country. The council points out that the significance of such industry-wide collective bargaining in the stability of San Francisco labor relations is indicated by report of the Secretary of Labor for 1942 that more than 75 per cent of all strikes in the country were against individual industrial establishments rather than against employer-industry groups.

Lumber Safety Program

California Lumbermen's Accident Prevention Association has been revived, after a hiatus since 1939, to provide for closer contact with the California Industrial Accident Commission than was possible merely through membership in the lumber branch of the Western Safety Council. Forty-eight active members have joined, and E. S. Mackins, Jr., safety director, Hammond Lumber Company, Samoa, is chairman and Nat Edwards, Wood Products Company, Ray Bldg., Oakland, is secretary-treasurer.

Equipment Wearing Out

Prospects of an early breakdown in truck transportation in California unless new equipment and replacement parts are made available are indicated in a field survey made under the direction of Grant Malquist of the California Railroad Commission. His study showed that 26 per cent of the motor trucks and tractors, 7 per cent of the semi-trailers and 32 per cent of the full trailers operated by for-hire motor carriers have been in service more than 10 years, and that about 27 per cent of the trucks and tractors, 14 per cent of the semi-trailers and 20 per cent of the full trailers used by carriers have a remaining useful life expectancy of less than one year.

Colson

MAKES IT EASY FOR

Women Workers

TO HANDLE HEAVY BARRELS AND DRUMS

IMAGINE a woman handling a 55 gallon drum almost as easily as pushing a vacuum cleaner. It's done with the Colson Drum Handling truck—the easy, safe way of handling barrels and drums of any size. Drums or barrels are placed on the truck without lifting—and unloaded just as easily. In pushing, the load is directly balanced over the wheels so that the heaviest barrels are moved with minimum effort. Handle is shaped to protect the operator at all times.

Instant adjustability of the hook permits handling any size drum or barrel from 24 to 40 inches high. Colson drum handling trucks stand upright when idle, taking up little floor space. The sturdy, all-welded steel construction assures long life under the hardest industrial use that is possible. These trucks can be supplied to those with proper priorities.

COLSON is moving things more efficiently on every front!

COLSON EQUIPMENT & SUPPLY CO.

LOS ANGELES SAN FRANCISCO

Material Handling Equipment

OPPORTUNITY SECTION

This widely-read column can help you to sell your used machinery and other used equipment. For rates, write to the Opportunity Section, *Western Industry*, 503 Market Street, San Francisco, California.

A. S. LINDSTROM CO.
Representing
METZGAR CO.
Conveyors & End-Wood Wheels
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THE OHIO ELECTRIC & MFG. CO.
Round and Rectangular Lifting Magnets
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SLIP RING MOTORS
Reconditioned
1 75 HP, 900 RPM, 440-Volt, 3 Phase, 60 Cycle, Type HV Fairbanks Morse Ball Bearing Slip Ring Motor.
1'50 HP, 900 RPM, 440-Volt, 3 Phase, 60 Cycle, Type MT General Electric Slip Ring Motor.
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Rewinding JEfferson 5255 — 2655 Santa Fe Avenue Los Angeles, Calif. — Repairing JEfferson 5255

TRANSFORMERS
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SINGLE PHASE, 50 OR 60 CYCLE— 2200 TO 110/220 VOLTS
3—1 K. V. A. Westinghouse
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3—10 K. V. A. Westinghouse
2—150 K. V. A. General Electric
We Design - Build - Repair
JEFFRIES TRANSFORMER CO.
1710 E. 57th St., Los Angeles, Calif.

Used Equipment Reported by WPB

Included in the large list of used equipment and material handled through the redistribution branch of the War Production Board, and offered by them as a service to industry, are among the following:

On Hand

Offered in Seattle

24" swing x 10'6" bed lathe, American. Quick change back-geared, complete with 18' 4-jaw chuck steady rest and powered by self-contained 3 h.p. 3-phase 60-cycle 220-volt driveall variable speed clutch unit, $2500.

Never reached the Philippines

One Mancha Titan B-type locomotive, new, storage battery type, narrow gauge, intended for a mine, was on boat for Manila at outbreak of war and turned back. In hands of bank.

Available in San Francisco; equivalent to 27" x 20' General Machine Co. lathe

Niles 24" x 20' cone type standard change 24" face plate tool post, steady rest, 2 centers, 2 center sleeves, countershaft, 2 pipe centers and arbor, tailstock, 21 change gears 22" jaw including chuck, 2 boring bars, 4 turning tools, 9" and 12" dog plates raising blocks to 28" swing, $2250.

Rockford shaper, also in San Francisco

24" double back geared crank type including 3 h.p. 3-phase 60-cycle 220-volt drive through Western 4-speed transmission bracket, starter, $2200.

Cylinder grinder, ditto

Heald No. 60 single pulley driver (less head), U. S. Van drive motor, 1 h.p., 220-440 volt, 3-phase, 60-cycle 1800 r.p.m., speed range 540-2700, including motor and drive. Rebuilt and guaranteed, $1565.

Bridgeford 26" x 8' cone type double back geared, arranged for overhead motor drive with 220-volt, 3-phase, 60-cycle motor, 2 change gear box, compound rest, centers and face plate, $2650.

Transformers, sizes ranging from 3 kva to over 100, San Francisco

All makes, Allis Chalmers, G-E, Westinghouse, etc., some serviceable.

One practically new $2500 G-E power transformer.

Unspecified number @ $300 each. Mounted on common steel base, 25 kva, condition repairable, air-cooled, 2200-440 volts.

Jeffries 5 kva 50-60 cycle single phase 110-220 volt primary, 2200 volt secondary.

Motor generators, d.c. and a.c.

3 kw Westinghouse, needs repair, $225; 1800 r.p.m., d.c., 125 volts compound wound, owned by San Francisco dealer.

12 kilowatt inter-pull electric generator, speed 780, voltage 110, d.c., $333 as is, needs repairs.

Located in Phoenix: good condition, G-E 220-volt 12 kw d.c. generator, 1750 r.p.m., complete and ready to operate.

Compressors

Air compressor unit, rebuilt and guaranteed, $175; 2 h.p., 1725 r.p.m., 200 volts, 3-phase, 60-cycle, 8 cu. ft. per minute. In Los Angeles.

Two Westinghouse locomotive type 49 cu. ft. per minute, 9½ x 9½ x 10. Available in Southern California on account of liquidation of cannery.

Woodworking equipment, in Oakland

1½ h.p. and 2½ h.p. De Walt saws, single phase motor, metal table, $225 and $275 as is.

Sandblast machine

Pangborn type LB-1, 8" diameter, direct positive pressure, automatic rotary table.

Considerable number of boilers

Including locomotive type, Scotch marine, vertical, horizontal return tubular, water tube, etc.

Other equipment

Sewing machines, shoe repair machinery pumps, electric motors, 10 h.p. and up.

TIME INSTRUMENT SERVICE
"Stop Watch Service"
★
We service Meylan, Harvard, Galley, Brenet, and others.
FINE WORK — SPEEDY SERVICE
Good reference
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Room 215, Bank of America Bldg.
HUNTINGTON PARK, CALIF.

WESTERN MARKETERS AND MARKETING

A monthly column devoted to the promotional and advertising plans of western manufacturers

Maintaining its expansion in step with the times, *Westinghouse Electric & Mfg. Co.* adds Milo L. Tally to the San Francisco office where he will serve in the advertising and publicity department as manager of application data.

Putting its post-war planning into concrete form, *Pacific Steel Casting Company*, Berkeley, announces appointment of Richard Prosser, San Francisco, as advertising counsel.

After many years as head of the Los Angeles office of *Brisacher, Davis & Van Norden*, Robert Davis retires to head up his own agency. Van Norden returns to the coast after a year handling of the New York office to take over the spot vacated by Davis in Los Angeles. New firm name will be Brisacher & Van Norden.

The Los Angeles office of *Gerth Pacific Advertising Agency* has expanded to new and larger quarters at 219 West Seventh Street.

An addition to the list of Salt Lake agencies is the *David W. Evans Advertising Agency*. Principals are David Evans, public relations counselor; Charles J. Jacobsen, commercial artist; and Kenneth S. Bennion, advertising executive. Offices in the McIntyre Building.

The Seattle office of *MacWilkins, Cole & Weber* announces that by mutual agreement it has resigned the Henry Mill & Timber Co. account of Tacoma. The new agency has not been appointed.

The newly formed *Joe Perrett Company*, Los Angeles agency moves its quarters to 816 West Fifth Street, Architects Bldg.

BUSINESS BOOKS

National Fire Codes for Flammable Liquids, Gases, Chemicals and Explosives, 1943. This book brings together the many standards dealing with fire and explosive hazards and supersedes the National Fire Codes for Flammable Liquids and Gases, Edition of 1938. This 504-page book is divided into nine parts as follows: Flammable Liquid Storage and Handling; Oil and Gasoline Burning Equipment; Liquefied Petroleum Gases; Utilization of Flammable Liquids; Gases; Refrigeration and Fumigation; Explosive and Nitrocellulose Materials; Tables of Properties—Hazardous Chemicals, Flammable Liquids; Flash Point Tests. Price $3.00. Published by *National Fire Protection Association, 60 Batterymarch Street, Boston, Mass.*

Booklets in a series on selecting, training and rating supervisors, include the following:

Selecting, Training, and Rating Supervisors, Bulletin No. 6.

Using Descriptions of Supervisory Jobs, Bulletin No. 7.

Describing the Supervisor's Job, Bulletin No. 8.

Selection of Supervisors, Bulletin No. 9.

Training of Supervisors, Bulletin No. 10.

Rating of Supervisors, Bulletin No. 11.

The bulletins cost $1.00 each, or Bulletins Nos. 6-11 may be obtained as a set priced at $2.50. Published by *Industrial Relations Section, California Institute of Technology, Pasadena 4, Calif.*

Aircraft Construction Handbook, by Thomas A. Dickinson. Clearly and simply written, this book covers all phases of aircraft construction, such as how a factory operates, simple aerodynamics, nomenclature, design principles, materials and processes, shop practice and inspection. It should be valuable as a reference for either beginners or professionals. Illustrations, tables, and useful data are abundant. Also there is a glossary of troublesome terms. Price $2.50. Published by *Thomas Y. Crowell Company, New York.*

Yes, They Had Post-War Planning Then, Too

Post-war planning is not something that has been invented since December 7, 1941. It was very much in evidence in the last war as is shown by the following excerpt from *Lengthened Shadows,* a history of the development of the power truck industry from the viewpoint of the Elwell-Parker Electric Company:

"During the first world war the salesmen and engineers carried on a campaign for post-war sales of trucks to the railroads for shop work. Surveys were made for the purpose of finding how the crane trucks could serve roundhouses and locomotive and car shops. These resulted in comparatively large orders being placed immediately after the armistice."

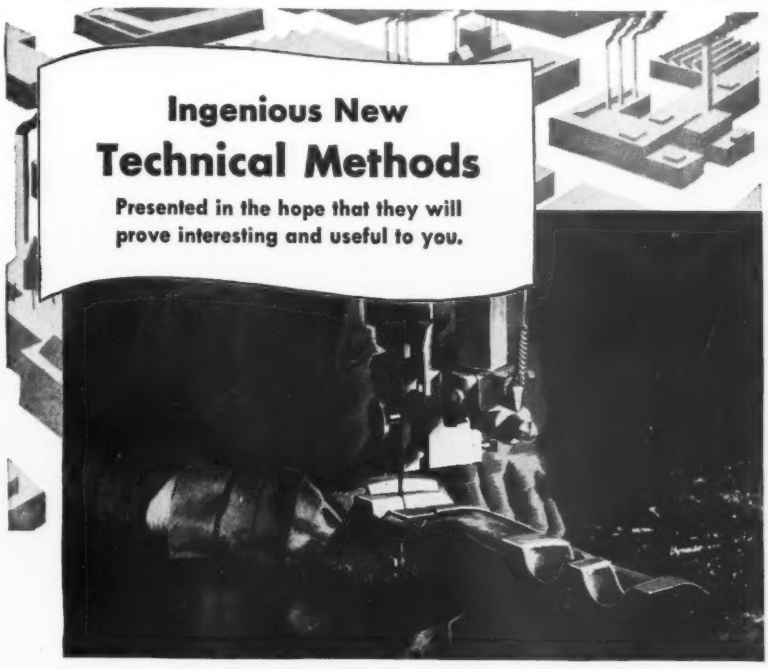
The fact that the Pacific Coast was in this post-war picture is noted in mentioning that the application of trucks to the needs of steamship companies opened up not long after the railroad business did.

"One of the special requirements at marine terminals was a truck which would furnish round-the-clock service. Ira G. Perin of San Francisco installed the first Elwell-Parker trucks of exclusively gasoline power, except for five load carriers with Ford engines built in 1919. M. R. Colby of Seattle, who has represented Elwell-Parker in the Northwest since 1911, has been fostering the use of better-built accessory equipment at the shipside."

Rubber From Farms

Discussing the possibilities of rubber from alcohol, Dean Wm. A. Schoenfeld of Oregon State College says:

"I have been told that most of the vehicle tires and rubber used by the German and Russian armies have been manufactured from the original crude alcohol produced on the many farms of those countries, which may have application in the West where we have a high concentration of agricultural products."



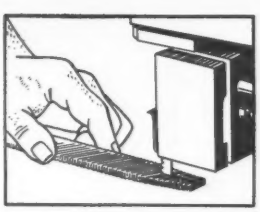
Hard Steels Cut by Heat Generated by Super High Saw Speeds

Ordinary band-saws, when operated at unbelievable high speeds up to 12,000 feet per minute, cut through hard steels and alloys by heat generated from the friction of the saw against the metal to be cut. The cutting effect is more that of burning through the metal than actual cutting. The heat generated is sufficient to melt or burn out the metal in the saw cut but not enough to draw the temper on the sides.

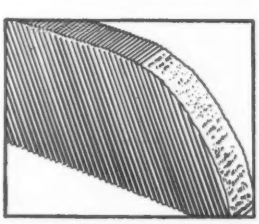
The hardness of either saw or metal to be cut is of little importance. Thin metal sheets are cut like paper, and plates up to one inch in thickness can be cut at speeds of ten inches per minute.

We hope this has proved interesting and useful to you, just as Wrigley's Spearmint Gum is proving useful to millions of people working everywhere for Victory.

You can get complete information about this method from Bell Aircraft Corporation, Buffalo, New York.



Proof of ability of new method to cut hard materials is demonstrated by operator cutting a file.



The temper of curve cut section shown above is unaffected.

X-60

THE WEST ON ITS WAY

ARIZONA

CONSTRUCTION—Morrison-Knudsen Company, 810 Title Guarantee Building, Los Angeles, has been awarded $200,000 contract by U. S. District Engineer Office, Los Angeles, for construction at an airfield at Yuma, Ariz.

BUILDING—Ed F. Bridgeman, Box 322, Willcox, Ariz., has been awarded contract by U. S. Dist. Engineer Area Office, Phoenix, for construction of building at an airfield at Tucson, Ariz.

HOSPITAL—King & McKee, San Diego, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of a hospital at a prisoners of war camp at Papago Park, Ariz., to cost between $100,000 and $200,000.

CONSTRUCTION—Bailey & McCoy, Tucson, Ariz., have been awarded contract by Home Owners Loan Corp. for construction at Tucson, Ariz.

BUILDING—Jacobson & Wikkolm, Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of a radio range building at an army air force flexible gunnery school at Kingman, Ariz.

SHOP—Gilbert E. Olson Const. Co., Phoenix, Ariz., has been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of a shop building at Coolidge, Ariz.

LAUNDRY—A. C. LaRue Const. Co., Tucson, Ariz., has been awarded contract by U. S. Dist. Engineer Area Office, for construction of laundry and dry cleaning facilities at Fort Huachuca, Arizona, to cost between $100,000 and $200,000.

BUILDING—W. A. Beaubien, 2331 E. Osborn Road, Phoenix, has been awarded contract by U. S. District Engineer Area Office, Phoenix, for construction of a signal corps building at an airfield at Tucson, Ariz.

CALIFORNIA

HOSPITAL WARD—Brock-Brady Co., 1717 University Ave., San Diego, has been awarded contract by U. S. District Engineer Area Office, San Diego, for construction of hospital ward and utilities at a camp in San Diego, Calif.

ARMY BUILDINGS—Anderson-Johnson Co., 4745 Hawley Blvd., San Diego, has been awarded contract by U. S. Dist. Engineer Area Office, San Diego, for construction of army buildings at a camp in San Diego County, Calif.

BARRACKS—Carl N. Swenson Co., 355 Stockton Ave., San Jose, has been awarded contract by U. S. Bureau of Yards & Docks, Navy Dept., Washington, D.C., for construction of WAVES barracks at Moffett Field, Calif.

DETENTION FACILITIES—Monson Bros., 475 Sixth St., San Francisco, have been awarded contract by Bureau of Yards and Docks, Navy Dept., for construction of detention facilities and shore patrol headquarters in San Francisco, Calif.

CONSTRUCTION—Ivan M. Wells Const. Co., Beverly Hills, has been awarded contract by U. S. District Engineer Office, Los Angeles, for construction at an observation airdrome at Ontario, Calif.

BUILDINGS—Stolte Inc., Alameda, has been awarded contract by District Engineer, Sacramento, for construction of buildings in Contra Costa County, Calif.

DOCK—Hull, Smale & Robinson, Wilmington, have been awarded $51,485 contract by Bureau of Yards & Docks, Washington, D.C., for construction of a dock for crash boats at the Marine Corps Air Station, Santa Barbara, Calif.

HOW TO PATCH FLOORS

....While Traffic Rolls

Here's a new, fast way to patch broken concrete without having to close off the area. Use durable INSTANT-USE . . . a tough, plastic material which you simply shovel into hole—tamp—and run traffic over immediately. NO WAITING. Bonds tight to old concrete. Makes smooth, solid, heavy-duty patch. Withstands extreme loads. Keep a drum on hand for emergencies. Immediate shipment.

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FLEXROCK CO.

2374 Manning Street, Philadelphia, 3, Pa.
564B Market Street, San Francisco, Calif.
924B S. Catalina Street, Los Angeles, Calif.

Please send me complete INSTANT-USE information . . . details of FREE TRIAL OFFER—no obligation.

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Company.....

Address.....

Not All Synthetics are Oil-Resistent!

Worn in contact with oils, acids or caustics, Stanzoil Gloves—made of DuPont's miracle synthetic, neoprene—often last 3 to 7 times longer than natural rubber gloves, provide busy hands that much surer safety from injury, keep production rolling, avoid costly disability claims. Stanzoils of neoprene do not cause skin irritation sometimes caused by rubber. Standard styles and sizes, black or white. Write today for current delivery data.

STANZOIL PIONEER

Synthetic Rubber Division

THE PIONEER RUBBER COMPANY

267 Tiffin Road, Willard, Ohio, U.S.A.

New York • Los Angeles

MADE WITH DU PONT NEOPRENE

BUILDING—W. C. Akard, San Francisco, has been awarded contract by Bureau of Yards and Docks, Washington, D.C., for recreation building at Tiburon, Calif.

HOUSING—Jere Strizek, Oakland, has been awarded contract by U. S. Engineer Office, San Francisco, for construction of housing in Northern California, to cost over $60,000.

BUILDINGS—Oliver M. Rousseau, San Francisco, has been awarded $82,300 contract by Housing Authority for the City of Richmond, for construction of buildings at Richmond, Calif.

SHOP—Standard Building Company, 1200 Judah Street, San Francisco, has been awarded contract by U. S. Engineer Office, San Francisco, for construction of ordnance maintenance shop in the San Francisco Bay Area, to cost under $80,000.

DWELLINGS—S. V. Hunsaker & Associates, Los Angeles, have started construction of 50 double dwellings at Gardena, Calif., to cost about $250,000.

HANGAR BUILDING—Millsap, Berger & Sayre, Los Angeles, have been awarded contract by Defense Plant Corporation for construction of hangar building at the Los Angeles Municipal Airport, Mines Field, Inglewood, to be occupied by Douglas Aircraft Corporation, and costing about $1,250,000.

FACILITIES—MacDonald & Kahn, Inc., San Francisco, have been awarded $222,300 contract by Bureau of Yards & Docks, Washington, D.C., for facilities at distribution center at Pleasanton, Calif.

BUILDINGS—Franchesi Const. Co., San Francisco, have been awarded contract by U. S. Engineer Office, Sacramento, for construction of buildings in Sacramento County, Calif.

BUILDING—Campbell Const. Co., Sacramento, has been awarded contract by U. S. Engineer Office, Sacramento, for construction of a building and utilities in San Joaquin County, Calif.

HOUSING—Harold C. Geyer, Monterey, has been awarded contract by U. S. Engineer Office for construction of housing in the Central California area, to cost over $140,000.

TRAINING CENTER—Baruch Corp., 625 S. Olive St., Los Angeles, has been awarded contract by U. S. Navy for construction of a small craft training center, Installment "A" at Roosevelt Base, Terminal Island, Calif., to cost about $390,000.

CONSTRUCTION—John A. Klarquist, Los Angeles, has been awarded contract by U. S. District Engineer Office, Los Angeles, for construction at Blythe, Calif.

DORMITORIES—Monk, Reese & Painter, Los Gatos, have been awarded $54,792 contract by Housing Authority of the County of San Joaquin for construction of 72 dormitory accommodations at Stockton, Calif.

TRAILER UNITS—Lawrence Const. Co., Sacramento, has been awarded contract by Housing Authority for construction of 50 trailer units at Stockton, Calif.

HOUSING—Moore & Roberts, San Francisco, have been awarded $2,884,589 contract by Federal Public Housing Authority, for construction of 1,896 family dwelling units in Berkeley-Albany area, Calif.

BUILDING—King and McKee, San Diego, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of building at Camp Irwin, Calif.

CONSTRUCTION—Oilfield Const. Co., Long Beach, has been awarded $240,760 contract by U. S. Navy, Public Works Office, San Diego, for construction at Destroyer Base, San Diego, Calif.

CONSTRUCTION—W. C. Beggs, Los Angeles, has been awarded contract by U. S. Engineer Office, Los Angeles, for construction at an army air base at Muroc, Calif.

BUILDING—K. E. Parker Co., San Francisco, has been awarded $254,564 contract by U. S. Army, Washington, D.C., for construction of a ship stores building and an administration building at Mills Field, South San Francisco, Calif.

BUILDINGS—Mead and O'Donnell, Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of additions to mess hall, and personnel buildings and utilities at the San Bernardino Air Depot, Calif.

OILITE

PRECISION

OIL CUSHION · BRONZE BEARINGS

Maintain An Oil Film — Prevent Metal to Metal Contact

"A Chrysler Product"

Stocks of over 400 sizes carried in five Principal Coast Cities

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PACIFIC INDUSTRIAL PRODUCTS CO., Oakland
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KINGWELL BROS. LTD. . . San Francisco

A competent staff of engineers backed by the Chrysler Engineering Laboratories is available for consultation on special problems. Inquiries are invited

Catalog No. 11 showing sizes stocked for immediate delivery will be sent upon request.

SINCE 1855

KINGWELL BROS., LTD.

444 NATOMA STREET TELEPHONE SUtter 0514 and 0515

SAN FRANCISCO, CALIFORNIA

THE WEST ON ITS WAY

CONTROL TOWER—Wells P. Goodenough, Palo Alto, has been awarded contract by U. S. Bureau of Yards & Docks, Washington, D.C., for construction of control tower at Naval Air Station, Moffet Field, Calif.

BUILDINGS—James H. MacFarland, San Francisco, has been awarded $50,000 contract by U. S. Engineer Office for construction of buildings in Contra Costa County, Calif.

DORMITORY—Donald & McKee, Redlands, have been awarded contract by Housing Authority of San Bernardino County, for construction of 100 dormitory accommodations in San Bernardino, Calif.

TRAILER UNITS—A. R. Liner, Merced, has been awarded contract by Housing Authority for County of San Joaquin, for construction of 100 trailer units at Stockton, Calif.

DWELLING UNIT—R. J. Daum, Inglewood, has been awarded $356,596 contract by Housing Authority of San Bernardino County for construction of 160 family dwelling units in Needles, Calif.

FACILITIES—P. J. Walker Company, Los Angeles, has been awarded $283,000 contract by U. S. Navy, Terminal Island, for construction at Roosevelt Base, Terminal Island, Calif.

SCHOOL—F. E. Young, San Diego, has been awarded $50,400 contract by U. S. Navy, San Diego, for construction of school building at Naval Training Station, San Diego, Calif.

BOILER HOUSE—Oilfield Const. Co., Long Beach, has been awarded $58,713 contract by U. S. Navy, San Diego, for construction of boiler house, etc. at Camp Elliott, near San Diego, Calif.

OPERATING ROOMS—W. C. Tait, Inc., San Francisco, has been awarded contract by Bureau of Yards & Docks, Navy Dept., Washington, D.C., for construction of additional operating rooms at the Naval Hospital, Treasure Island, San Francisco.

BUILDING—Dinwiddie Const. Co., Inc., San Francisco, has been awarded $72,426 contract by Bureau of Yards and Docks, Navy Dept., Washington, D.C., for construction of a trainer building at Point Montara, Calif.

BUILDINGS—MacDonald & Kahn, Inc., San Francisco, have been awarded $116,800 contract by Bureau of Yards & Docks, Navy Dept., Washington, D.C., for construction of two recreational buildings at Camp Parks, Pleasanton, Calif.

BUILDING—Allied Contractors, Inc., Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of navigation trainer building at Blythe, Calif.

WAREHOUSES—Morrison-Knudsen Co., Inc., and Ford J. Twaits Company, Los Angeles, have been awarded contract for construction of five warehouses in the San Francisco Bay area, to cost under $1,000,000.

CONSTRUCTION—Rice & Billings, Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction at Fort MacArthur, Calif.

SHOP—M. A. Imhoff & Associates, San Gabriel, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of metal, woodworking and typewriter repair shop at Camp San Luis Obispo, Calif.

HOUSING—Howson Bros., Gilroy, have been awarded contract by U. S. Engineer Office, San Francisco, for construction of housing in Central California.

FAMILY DWELLINGS—Shepherd & Green, Stockton, have been awarded $419,915 contract by Housing Authority, San Joaquin County, for construction of 220 family dwelling units at Stockton, Calif.

DORMITORY UNITS—Harris Const. Co., Fresno, has been awarded contract for construction of 30 dormitory units in Tracy, Calif.

FAMILY DWELLINGS—L. H. Hansen & Sons, Fresno, have been awarded $74,482 contract by Housing Authority, San Joaquin County, for construction of forty family dwelling units in Manteca, Calif.

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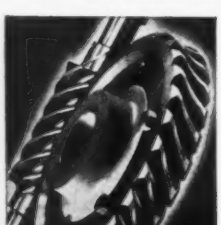

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HOUSING—Ford J. Twaits Co. and Morrison-Knudsen Co., Inc., San Francisco, have been awarded contract by U. S. Engineer Office for construction of additional housing in Northern California, to cost $750,000.

COLD STORAGE BUILDING—Jackson Bros.-LeSage, Los Angeles, have been awarded $53,950 contract by U. S. Navy, San Diego, for construction of cold storage building at Kearney Mesa, Miramar, Calif.

SCHOOL—Stanton-Reed Co. and J. W. Breedlove, Los Angeles, have been awarded $159,998 contract by U. S. Navy, San Diego, for alterations and construction of additional classrooms and shops at the Fleet School, Destroyer Base, San Diego, Calif.

SCHOOL—P. A. Weeger, Los Angeles, has been awarded contract by Federal Works Agency for construction of addition to Horace Mann Elementary School, Bellflower, Calif.

BUILDING—C. W. Driver, Inc., Los Angeles, has been awarded contract by the Bureau of Yards & Docks, Washington, D.C., for construction of a building at the Naval Air Station, San Diego, Calif.

BUILDINGS—Haddock Engineers, Ltd., Oceanside, Calif., have been awarded contract to build a large group of buildings at Camp Joseph Pendleton, near Oceanside, Calif.

ALTERATIONS—Monson Bros., San Francisco, have been awarded $111,178 contract by Bureau of Yards & Docks, Navy Dept., Washington, D.C., for additional alterations of training facilities at San Bruno, Calif.

HOUSING—L. H. Hansen & Sons, Fresno, have been awarded $517,945 contract by Federal Public Housing Authority, San Francisco, for construction of 320 family dwelling units at Eureka, Calif.

COLORADO

HOUSING FACILITIES—M. E. Carlson, Denver, has been awarded contract by U. S. District Engineer for construction of housing facilities for air transport command personnel, Denver, Colo.

FAMILY DWELLINGS—Worshaw & Herbst, Denver, have been awarded $76,477 contract by Federal Public Housing Authority for construction of 15 family dwelling units at Cowdrey, Colo.

GUEST HOUSES—Northwestern Engineering Company, Denver, has been awarded contract by U. S. District Engineer Office, for construction of two guest houses at a military installation in Eagle County, Colo.

WAREHOUSES—E. B. Jones, Jr., 1010 S. Josephine Street, Denver, has been awarded contract by U. S. District Engineer Office, for construction of four warehouses and utilities in Denver, Colo.

TRAILER PROJECT—Larsen & Udesen, 944 Osage Street, Denver, have been awarded contract by Federal Public Housing Authority, for construction of a trailer project and 15 family dwelling units at Kokomo, Colo.

WAC FACILITIES—F. J. Kirchhof Const. Co., Denver, has been awarded contract by U. S. District Engineer Office, Denver, for construction of WAC facilities in the vicinity of Denver, Colo.

HOSPITAL—Northwestern Engineering Company, Denver, has been awarded contract by U. S. District Engineer Office, for construction of hospital expansion in Eagle County, Colo.

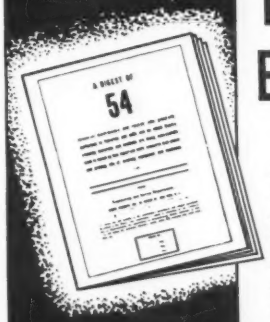
IDAHO

HOUSING—The National Housing Agency has authorized three Idaho housing projects, two in Boise and one at Bayview, near the Farragut naval training station.

BUILDING—H. J. O'Neel, Caldwell, Idaho, has been awarded contract by U. S. Engineers, Portland, for construction of building additions in Ada County, Idaho.

BUILDING FACILITIES—J. O. Jordan & Son, Boise, Idaho, have been awarded $170,000 contract by U. S. Engineers for construction of additional building facilities in Ada County, Idaho.

FREE Plant Maintenance DIGEST



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THE WEST ON ITS WAY

MONTANA

BUILDINGS—Four buildings for Northern Pacific Railway at Livingston, Mont., have been started, with a $1,450,000 addition to locomotive repair shops also planned. According to the Austin Company of Seattle, construction has been approved by WPB.

WAREHOUSES—Dudley Anderson Company has been awarded contract by U. S. Army Engineers for construction of two warehouses in Clark County, Mont.

NEVADA

PLANS—Koebig & Koebig, Los Angeles, have been awarded architect-engineer contract for preparing plans and specifications for program of temporary construction at Las Vegas, Nev.

NEW MEXICO

BUILDINGS—K. L. House Const. Co., Albuquerque, N. M., has been awarded contract by U. S. District Engineer Office for construction of additional buildings at an airfield in Bernalillo County, N. M.

CONSTRUCTION—Parks Const. Co., Dallas, Texas, has been awarded contract by U. S. District Engineer Office for construction in Otero County, N. M.

INSTALLATION—The War Dept. has announced authorization for construction of an army air forces installation in Chaves County, N. M., to cost in excess of $2,000,000.

OREGON

TRAILER PARK—Drake, Wyman & Voss, Inc., Portland, Ore., have been awarded contract for construction of a 50-unit trailer park at Toledo, Ore.

BUILDING—Henrikson Construction Company has been awarded contract by Safeway Stores, Inc., for construction of a store and market building at Portland, Ore.

HOSPITAL—L. H. Hoffman, Portland, has been awarded $708,678 contract by Bureau of Yards and Docks, Navy Dept., Washington, D.C., for construction of hospital at the Tongue Point Naval Air Station Reservation, Astoria, Ore.

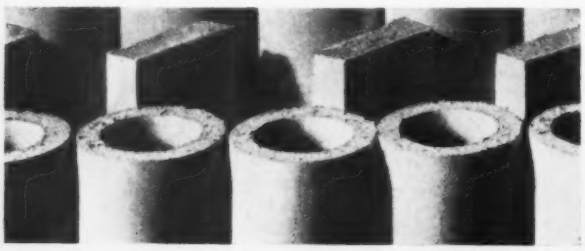
ADDITION TO BUILDING—C. R. Schmiedeskamp Const. Co., Portland, has been awarded contract by U. S. District Engineer Office, Portland, for construction of addition to cold storage building in Benton County, Ore.

UTAH

SERVICE CLUB—Jacobson Const. Co., Salt Lake City, has been awarded contract by U. S. District Engineer, Salt Lake City, for construction of a service club at the Ogden Air Depot, Ogden, Utah.

HOUSING—Ford J. Twaits Company, Los Angeles and Salt Lake City, has been awarded contract by U. S. District Engineer Office, Salt Lake City, for construction of additional housing at Dugway, Utah.

BUILDING—Harrison & Dorman, Salt Lake City, have been awarded contract by U. S. District Engineer Office, Salt Lake City, for construction of a navitrainer and squadron operation building at Wendover, Utah, to cost between $80,000 and $90,000.



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HORIZONTAL PLATE HOOKS may be used in sets of either two or four. Will handle one or more plates at each lift. They are time and labor savers for fast loading or unloading when plates are to be stacked in the flat position.

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WASHINGTON

CONSTRUCTION—Woodworth & Macdonald Building Company, Tacoma, have been awarded contract by U. S. Engineer Office, for additional construction in Grant County, to cost about $700,000.

UTILITY YARD—Gaasland Const. Company, Ellensburg, have been awarded contract by U. S. Engineer Office, Seattle, for construction of utility yard in Snohomish County, Wash.

HOUSING—A. F. Mowat, Seattle, has been awarded contract by U. S. Engineer Office, Seattle, for housing facilities in Snohomish County, Wash.

WAREHOUSE—Clyde M. Ludberg Company, Spokane, has been awarded contract by U. S. Engineer Office for construction of warehouse in Grant County, Wash.

HOUSING FACILITIES—A. F. Mowat Const. Co., Seattle, has been awarded contract by U. S. Army Engineers for construction of housing facilities in King County, Wash.

HOSPITAL—Sound Construction & Engineers Company, Northern Life Tower, Seattle, has been awarded $639,000 contract for construction of Doctors' hospital in Seattle, Wash.

PACKING PLANT—Henrik Valle, 407 Third Avenue North, Seattle, has been awarded contract by Frye & Company, 2203 Airport Way, Seattle, for construction of packing plant to cost about $500,000.

HOSPITAL—Hoard Engr. Co., Inc., Seattle, has been awarded a $432,012 contract by the Federal Works Agency, Washington, D.C., for construction of a 100-bed hospital at Bryn Mawr, near Renton, Wash.

BUS TERMINAL—West Coast Construction Company has been awarded $426,896 contract by Boeing Aircraft Company for construction of a bus terminal at Seattle, Wash.

CONSTRUCTION—A. A. Durand & Son, Walla Walla, has been awarded contract for additional construction in Grant County, Wash., by U. S. Army Engineers.

BUILDING—Clyde M. Ludberg, Spokane, has been awarded contract by U. S. Engineer Office, Seattle, for extension to a building in Grant County, Wash.

SCHOOL—Clyde M. Ludberg, Spokane, has been awarded contract for construction of school in Grant County, by U. S. Engineer Office, Seattle, Wash.

COLD STORAGE FACILITIES—Clyde M. Ludberg Company, Spokane, has been awarded contract by U. S. District Engineer Office for construction of cold storage facilities in Spokane County, Wash.

SCHOOL—Erickson, Hagen & Anderson, Seattle, have been awarded $148,858 contract by Federal Public Housing Authority and Federal Works Agency for construction of school at Port Orchard, Wash.

COLD STORAGE PLANT—Johnson, Goetz and Brennan, Seaboard Building, Seattle, have been awarded contract by U. S. District Engineer Office for construction of a cold storage plant in King County, Wash., to cost about $60,000.

TANK CONVERSION—Rumsey & Co., Seattle, have been awarded $74,715 contract by Bureau of Yards and Docks, Washington, D.C., for conversion of tanks at Naval Station, Manchester, Wash.

WAREHOUSE—Woodworth & Co., and Macdonald Bldg. Co., Tacoma, have been awarded contract by U. S. District Engineer Office for construction of warehouse in Grant County, Wash.

WYOMING

DWELLING UNITS—F. J. Kirchhof Co., Denver, has been awarded $608,830 contract by FPHA for construction of 240 temporary dwelling units at Cheyenne, Wyo.

CONSTRUCTION—Newstrom-Davis & Co., Denver, Colo., have been awarded contract by Home Owners Loan Corp. for about $75,000 for construction in Cheyenne and Casper, Wyo.

CONSTRUCTION—Green Bros., Cheyenne, have been awarded contract by the Federal Works Agency for construction of a Public Health Center in Cheyenne, Wyo.

BUILDING—J. R. Snedaker, Cheyenne, has been awarded contract by City Clerk, Cheyenne, for construction of an addition to the Wyoming Aircraft School building at Cheyenne Municipal Airport, Wyo.

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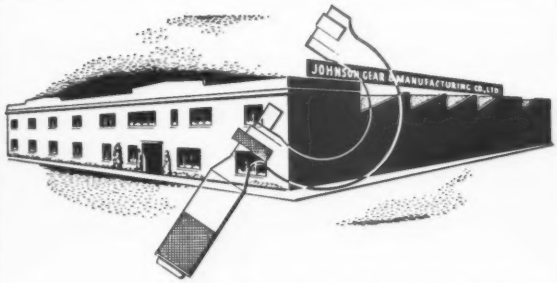

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WESTERN TRADE WINDS

NEWS ABOUT THOSE WHO DISTRIBUTE AND SELL INDUSTRIAL EQUIPMENT AND MATERIALS

Ralph M. Hoffman, former vice president in general charge of sales, Link-Belt Company, Chicago, has been elected president of the Link-Belt Company Pacific Division, with headquarters in San Francisco. He replaces B. A. Gayman who is retiring from active service but continues as director of the parent Link-Belt Co.

Universal Metal Products, Ltd., now occupies its new plant at 2940 East Olympic Boulevard, Los Angeles. The company produces tools, dies, metal stampings and aircraft parts.

George R. McNear has been appointed Pacific Coast sales manager, tire division, United States Rubber Company, with headquarters in Los Angeles.

J. C. Vignos has been appointed general manager of sales for the Ohio-Ferro Alloys Corporation, Canton, Ohio. He succeeds **H. A. Landon,** who has become the Pacific Coast representative of the company.

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510 First Ave. South Seattle 4, Washington

A Seattle office has been opened by the **George M. Philpott Co.,** at 1901 Airport Way, corner of Holgate, with **R. A. Sanguinetti** as northwestern division manager. He has been some 25 years in the bearing business, and for a large portion of this time acted as western division manager for the Timken Roller Bearing Company. The main Philpott office is at 1160 Bryant Street, San Francisco, and the concern specializes in two fields, rock drilling equipment and supplies, and ball and roller bearings. Lines represented include Gardner-Denver compressors and rock drills, Timken detachable bits and drill rods, Bethlehem Steel Company wire rope, and all types of ball and roller bearings for use with industrial and construction equipment, together with rough bronze for use in bushings. The Seattle office is primarily a bearings specialty office, handling all of the national lines of ball and roller bearings and providing engineering and service to the industrial plants and the construction industry. In the San Francisco territory the Philpott Company are exclusive distributors for Marlow pumps.

Earl Herring, president and general manager, Airplane Mfg. & Supply Corporation, Glendale, Calif., heads the new organization setup by which Pacific Airmotive, the manufacturing division of Airplane Mfg. & Supply Corp. and Airplane Parts & Supplies have been united to co-ordinate war production. The managing company will direct the activities of thirteen plants located in the San Fernando Valley north of Los Angeles, in San Diego and in Oakland, Calif. Other officers are: **E. O. Locker,** assistant general manager and secretary-treasurer; **R. B. Lacoe,** vice president and **K. R. Jamison,** vice president in charge of sales.

Mercer Steel Company, Portland, Oregon, has been appointed representative for Irving Subway Grating Company of Long Island City, New York, according to J. C. Lynn, Western regional manager, at Emeryville, Calif.

Turco Products, Inc. have opened an organic research laboratory in order to keep pace with new problems in the metal industries. **Dr. Nathaniel Baum,** who was formerly consulting chemist in organic synthesis and resins in Chicago, has been appointed head of the new department in Los Angeles.

R. C. Cairns has been appointed to head up the Seattle territory for the Tri-State Supply Corporation, where a new office and warehouse have been opened. The office is located at 318 Occidental Avenue, Seattle 4. The additional warehousing facilities will afford a ready supply of wire, brushes, and other items needed in the manufacture and maintenance of electric motors, transformers and generators to the industries of Washington, Oregon, and Idaho.

R. N. Simpson and **A. F. Simpson Jr.** have purchased the long-established firm of Davenport Manufacturing Company in Los Angeles, manufacturers of the "JUMBO" lines of farm equipment and road machinery, also ship parts including masts, hatches and other articles. **Everett T. Small** has been appointed manager of the farm implement and road machinery divisions.

D. Earl McElroy has been appointed special mill representative on the Pacific Coast for Lukens Steel Company and its subsidiaries, By-Products Steel Corporation and Lukenweld, Inc., Coatesville, Pa. In his position Mr. McElroy will act in a liaison capacity between the Lukens companies and C. T. Hansen & Company, Pacific Coast sales representative of Lukens and its subsidiaries, with offices in San Francisco, Los Angeles and Seattle.

F. H. Lindus has been appointed Pacific Coast manager of the Bower-Tapered Roller Bearing Division of Precision Bearings, Inc.

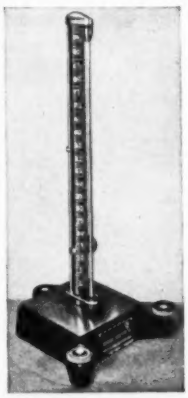
Glen Davidson has become sales engineer for the Western Machinery Company, working out of its Salt Lake City, Utah, office.

Warren & Bailey Company, 350 South Anderson Street, Los Angeles, has been appointed Southern California distributor for The Rock-Tred Corporation of Chicago, manufacturers of Speed-Patch, Rock-Tred Resurfacer and Condurock.

Herman Yaras, former president of the Marsman Trading Corporation in the Philippines, has recently formed a new importing and exporting company in Los Angeles. This concern will occupy itself primarily with the development of distribution contacts in Central and South American countries, and the Far East.

THE SHOWCASE

Resiliometer—This new instrument gives the answer to rubber technologists and research scientists, manufacturers and consumers of rubber products or other extensible materials, on how much resiliency or "springiness" is possessed by the material in question. *Precision Scientific Co., Chicago, Illinois.*

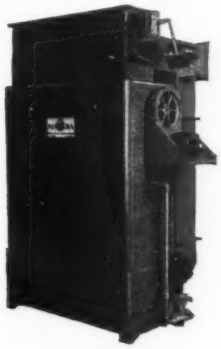


StaSafe Eye Mask—One-piece plastic eye mask is adjustable to any head size, light weight, with no reflection or distortion and is non-flammable and heat resistant. *Standard Safety Equipment Company, Chicago, Illinois, and Dickson Safety Products Co., Los Angeles, Calif.*

Rivet Tape—Adhere Rivet Tape, made of transparent glassine paper, is gummed on both edges with the adhesive qualities needed to hold flush rivets firmly in place until they're riveted. When the riveting is finished, the glassine tape peels off quickly and cleanly. Its chief features are low cost with all the serviceable qualities required for its simple job. *Adhere, Inc., Los Angeles, Calif.*

Stencil Machine—Diagraph-Bradley Stencil Machines are now made in sizes larger than 1". Their complete letter sizes are as follows, ½", ¾", ⅞", 1¼", 1½", and 1¾". *Diagraph-Bradley Stencil Machine Corp., St. Louis 8, Missouri.*

Heat Exchanger—A new method of automatic temperature control for the Niagara Aero Heat Exchanger as used for cooling industrial liquids is based on controlling the amount of outside air passed through the evaporative cooling chamber rather than altering the flow of liquid being cooled. More accurate and effective cooling is obtained, water is saved and the use of refrigeration made unnecessary in many applications. *Niagara Blower Company, New York.*



Repair & Resurfacing Compound—Concrete-like compound LEV-L-FLOR is available in ready-mixed form for quick and easy use to repair or completely resurface broken or worn floors, driveways, ramps, etc. An entire floor or roof area may be resurfaced and leveled overnight. No skilled labor is required. It does nine jobs in one application: repairs, resurfaces, water-proofs, dust-proofs, acid-proofs, damp-proofs, slip-proofs, decay-proofs, and weatherproofs. *Lev-L-Flor Division (Dept. WI), Central Paint & Varnish Works, Brooklyn 1, New York.*

Cable Reel Dollies—This dollie does away entirely with blocks and jacks—simply roll the coil onto the dollie and start to pay out. Therefore saves time by eliminating at least two operations. Comes in two sizes. *Metzgar Company, Grand Rapids, Mich.*

Slide Chart—Elemoto Slide Chart for engineers and draftsmen has on the front side U. S. Standard dimensions for coarse and fine thread series. When the slide inside is moved to the right or left, the standard dimensions for each size from 0 to 1¼" are placed at the windows in the blueprint dimension drawings. All required dimensions such as threads per inch, major and minor diameters, head sizes, etc., are obtained with one reading. This side also carries decimal equivalents of fraction and a table of U. S. Standard Gages for steel sheets. The reverse side is used to obtain dimensions for U. S. Standard Woodruff Keys. The lower section is used to determine dimensions for American Standard Pipe Threads. This side also carries a table for changing milimeters to inches, a table of Twist Drill and Steel Wire Gages. The slide is water resistant, has a washable surface and is of durable construction. *The Elemoto Sales Company, Teaneck, New Jersey.*

Underwater Cutting Torch—Model 3900 has air mantle so designed that it limits the annoying slagging of the tip and adjustments can be made under water without losing parts. The gas control valves are so located and designed that they can be easily manipulated when the diver wears heavy gloves and operates in murky water. The torch is easily maintained in service and reconditioning can be undertaken with a minimum of previous skill or special tools. *Victor Equipment Company, San Francisco, Calif.*

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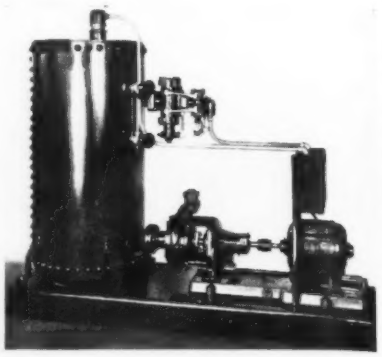
THE SHOWCASE *(Cont'd from Page 63)*

Heat Insulating Material — Plant Precision Molded 85% Magnesia weighs only 11 pounds per cubic foot and brings thermal conductivity to a new low over the full range of temperatures. Tests show its average Kf is .354 compared to Kf of .457 for heat insulating material of 16.8 lbs. cubic foot density. Application is speeded and simplified, lasting quality and controlled uniformity assured. *Plant Rubber & Asbestos Works, San Francisco 7, Calif.*

Blind Rivet—Preco rivet, with the simplicity and reliability of a common screw and nut, requires no special care as to storage, handling and use, no special tools for installation, no special operations, extra drilling or reaming. It is unaffected by heat or cold or sudden changes of temperature, is complete upon arrival and ready for installation, and can be reliably test-inspected. *Pacific Railway Equipment Company, Los Angeles, Calif.*

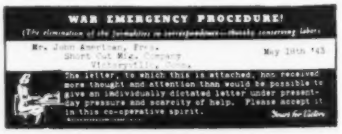
Fire Retardant—Flamort, obtainable in both powdered and liquid form and applicable to building materials and textiles, does not stain or discolor, is non-poisonous, and is a chemical preventive or fire retardant. Using Flamort is fighting a fire before it starts. *Flamort Chemical Company, San Francisco, Calif.*

Boiler Feed Systems—Expansion in line of boiler feed systems to include a new large size pumping unit, a standard coupled type pump, in addition to the close-coupled type originally offered. The standard coupled pump is offered for installations where space is not at a premium. It permits the use of standard type motor which simplifies replacement. The new

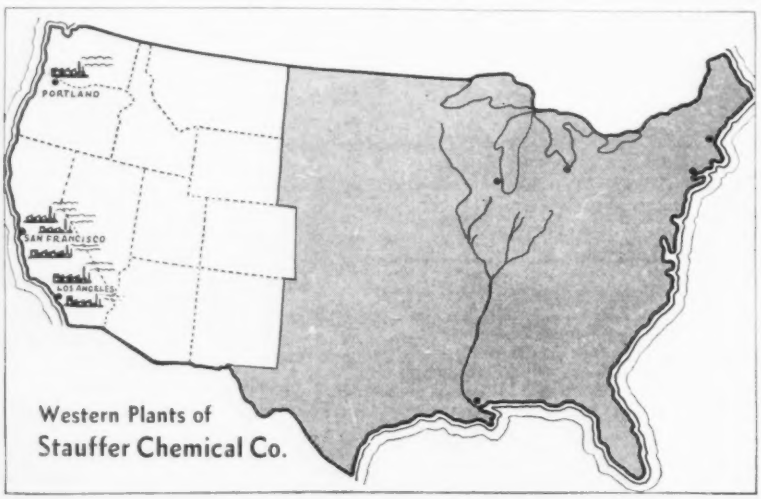


pumping unit, like the original close-coupled type, employs the "pressure equalizing" principle of operation. Instead of fighting against boiler pressure, the system admits this pressure to an equalizing chamber behind the pump during operating cycles, which leaves only the task of raising the returned condensate a few feet to the boiler water level. This short cut, it is claimed, saves as much as 60 per cent of power pumping cost, and permits the use of a low speed, low pressure centrifugal pump. Savings in fuel are obtained by venting the equalizing chamber of the pump unit to the condensate receiver. This makes it possible to maintain a slight controlled pressure on the returns. Condensate, consequently, can be returned to the boiler at far higher temperatures than is possible under atmospheric pressure or vacuum conditions. *Johnson Corporation, Three Rivers, Michigan.*

Steno-Saver Label—Label 6" x 2" in size, used in connection with a letter. In the white blank space of the label the user



types the name and address of the recipient, making a form letter more personal and easier handling for mailing departments at both ends of the line. The left edge of the label is tipped onto the left margin on the letter, partly covering the typed matter on the letter. The labels come in rolls for convenient feeding into a typewriter and cut stenographic work considerably. *G. P. Blackiston, New York City, New York.*



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YOURS FOR THE ASKING

1331

Marketing, Distribution and Selling—"The Hope of Industry" by Spencer W. Curtiss, offers many new thoughts on proper planning for post-war business. It analyzes industrial problems at the time of demobilization, points out that post-war planning must deal primarily with sales and distribution problems rather than production, discusses customer relationships, offers proved controls for building customers, and contains a chapter on the opportunities for small industry in the post-war period. *Spencer W. Curtiss, Inc., San Francisco, Calif.*

1332

Machinery—Attractively illustrated booklet describing the company's five divisions: mill and woodworking machinery, machine tools, construction equipment, electrical machinery, and industrial equipment. Though by no means a complete story of the company's progress, it gives an idea of their large organization. *Star Machinery Company, Seattle, Wash.*

You owe it to yourself to keep posted—only the efficient business survives under the strain and pressure of the war effort. Literature listed in these columns may be just the answer to your need for greater production, substitute materials or knowledge of how to care for your equipment. Just drop a note to Western Industry, 503 Market St., San Francisco, and copies will be forwarded to you. If you do not use business letterheads, please name your company affiliation.

1333

Riveting Wall Chart—Wall chart containing all essential information on Cherry Blind Riveting operations has a scale reproduction of both countersunk and brazier head rivets, showing quickly the proper rivet to be used for any thickness of material from .030 in. to .391 in. Three columns of rivets give accurate guide to rivet sizes for three types of installations. Illustrations with brief description show correct way to install Cherry Rivets. *Cherry Rivet Co., Los Angeles 13, Calif.*

1334

Recreation—"Recreation—A Resource of War" is a pamphlet prepared to help communities in war areas, management and labor, to meet the off-the-job needs of war workers and their families. *The Division of Recreation, Federal Security Agency, Washington 25, D.C.*

1335

Shipper's Handy Helper—"Shipper's Handy Helper Catalogue" gives complete information about marking shipments, together with U. S. Army specifications, including metric conversion table which converts both ways: yards to meters and feet to meters, pounds to kilograms, quarts to liters and gallons to liters. This catalogue will help the shipping clerk ship correctly to the U. S. Government and also shipments for export. *Diagraph-Bradley Stencil Machine Corporation, St. Louis, Missouri.*

1336

Drill Presses—Booklet describing in detail entire line of 75 models of Boice-Crane drill presses also contains engineering data and suggestions for incorporating Boice-Crane parts into special machines. Handy, time-saving accessories also are described. *Boice-Crane Co., Toledo, Ohio.*

1337

Magnets—Bulletin No. 150, "Ohio Rail-Rectangular and Special Lifting Magnets," and Bulletin 111, "Ohio Lifting Magnets" describe and illustrate uses of lifting magnets. *A. S. Lindstrom Company, Western representatives of the Ohio Electric Mfg. Co., San Francisco, Calif.*

1338

Foundry Equipment—20-page reference catalog No. 40, "The American Line," profusely illustrated, presents summary of products including wheelabrator airless blast cleaning equipment, metal washing machines, dust collectors, sandcutters, sand blast equipment, etc. Also included are operating views of typical installations of these products in industrial plants and a description of the mechanics, applications and advantages of the airless wheelabrator method of abrasive blast cleaning. *American Foundry Equip. Co., Mishawaka, Indiana.*

1339

Welding—Four-page, two-color bulletin No. 201 presents in concise form the full Ransome line of welding positioning equipment; specifications, important features, load rating tables and dimensions are included. *Ransome Machinery Company, Dunellen, New Jersey.*

2 HEAVY DUTY, SPARK-PROOF FLOORING MATERIALS

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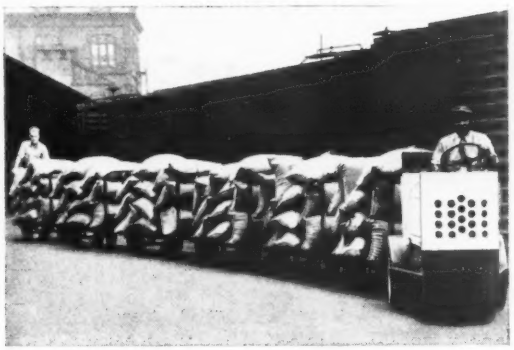

The above photo illustrates how heavily laden, small-wheeled trucks sail over a ROCK-TRED resurfaced loading platform.

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2003 RANGEVIEW DRIVE - - - - GLENDALE 1, CALIFORNIA

YOURS FOR THE ASKING *(From Pg. 65)*

1340

Truck and Caster—"Job-Suited" truck and caster catalog is written and illustrated to enable anyone to select exactly the right truck for the handling job he has in mind. It contains information along the line of basic material handling engineering. *Thomas Truck and Caster Company, Keokuk, Iowa.*

1341

Metal Cleaning—"Oakite Compound No. 84" is a 12-page instruction manual reviewing the application of this recently developed acid-tvpe material to a number of varied metal cleaning operations. It gives new data on acid-detergent techniques designed to remove many special types of deposits from ferrous and non-ferrous war supply parts during fabrication. *Oakite Products, Inc., New York, N. Y.*

1342

Lighting—16-page booklet, "Value of Good Lighting in War Production" contains many laboratory findings and opinions from industrials on the lighting subject and will interest the industrial who contemplates having his lighting requirements brought up to standards by a lighting specialist. *Fostoria Pressed Steel Corp., Fostoria, Ohio.*

1343

Lumber Design Specifications—The application and engineering design of the "National Emergency Specifications for the Design, Fabrication and Erection of Stress Grade Lumber and Its Fastenings for Buildings—Directive 29," made mandatory by WPB on and after November 1, 1943, is simplified through use of Wood Structural Design Data series of publications. Leaflet "Notice to Owners of Copies of W.S.D.D." tells how to use the series in conjunction with the WPB directive and specifications. *National Lumber Manufacturers Association, Washington 6, D.C.*

1344

Skin Trouble—Protective Practi-Kreme is described in new folder "Are Yours Fitted for Fighting?" *Prack Laboratories, Inc., New York.*

1345

Metal Cleaning and Finishing Machinery—32-page catalog and manual gives new data and applications for metal cleaning and finishing machinery. Problems involved in cleaning and finishing metal parts are described and illustrated in detail. Information is presented on the various types of cleaning machines, methods and materials. *Howard Engineering and Mfg. Co., Cincinnati, Ohio.*

1346

War Minerals—Complete survey of war minerals situation in the Southwest. "War Minerals—Metals," has been published by the Domestic Trade Department, Los Angeles County Chamber of Commerce. Strategic minerals covered in the report include aluminum, antimony, chromium, copper, iron ore, lead, magnesium, manganese, mercury, tungsten, zinc, etc. *Los Angeles County Chamber of Commerce, Los Angeles, Calif.*

1347

Expansion Anchoring Devices—20-page catalog presents helpful data for uses of all types of expansion anchoring devices, including expansion bolts, expansion nuts, anchoring units, hook bolts, drilling devices, etc. This handy guide book is completely illustrated with full installation instructions. *Chicago Expansion Bolt Co., Chicago 12, Illinois.*

1348

Furnaces for Heat-Treating Tools, etc.—Bulletin containing facts dealing with performance, construction, uses, heating principles and standardized models of furnaces which are arranged with gas or electric heating systems and for temperatures up to 1250 degrees F., making them ideal for heat treating shops, production lines, and research and control laboratories. *Despatch Oven Company, Minneapolis, Minn.*

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It take
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It takes food and plenty of it to keep Uncle Sam's fighting men in trim. These cases ... largely canned carrots and sausage in the foreground were piled on a New Caledonia dock preparatory to distribution.
(U. S. Navy Photo from Acme)

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